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diaries is the weather, and this attention is an indication of the great concern which the farmer had for the most important and uncalculable factor in farming. The general day-by-day and season-by-season routine of farm life may be traced in diaries, and the shifts in methods, production, and interests over a period of years gradually manifest themselves. Something is also usually given about implements and machinery. Prices paid for land and supplies and received for farm produce are recorded, sometimes systematically and sometimes only in a haphazard way. The effects of panics, depressions, and wartime inflations on rural life are often revealed, and frequently there are notations that throw light on the mental basis of the farmer's enmity for middlemen and towns—an attitude usually basic to the various protest movements.

Interesting data on the farmer and planter as social beings are also afforded in the diaries. They delineate the focal points of the social life in rural communities—especially the school, the church, and the plantation house—and indicate the rôle played as well as the amusements and entertainments supplied by each. The accepted codes of manners, customs, and morals are reflected in the notations of affronts to them. Similarly the comments on books, magazines, and newspapers indicate prevailing intellectual tastes.

A notable farm diary which has recently been made available in printed form is that of Mary Dodge Woodward, a New Englander who settled near Fargo in Dakota Territory.⁵ It covers the years 1884-89 and is especially valuable for the comments on the contrasts between pioneer conditions in the Red River Valley and those of the author's former homes in Wisconsin and Vermont. She also gave special attention to the climatic and other geographical features which affected settlement and to the changes in farming techniques and housekeeping methods.

As a historical source, farmers' diaries are more satisfying in some respects to the general than to the agricultural historian. It is seldom possible to trace the operation of a farm and the activities of its family in detail through them. In the words of the historian who has made the most careful analysis of the content of this source, "The entries give comparatively little information about the breeds of livestock and the varieties of grains that the farmer raised, his shifts from one breed or crop to another, and his reasons for making them. The diaries ignore the things that the farmer took for granted—his clothes, the interior of his house, his tools, his wife." They do, however, "convey to the reader something that is difficult to transfer to any account of them: the atmosphere of farm life, an appreciation of its struggles, hopes, and defeats."⁶

⁵ M. D. Woodward, *The Checkered Years*, edited by M. B. Cowdrey (Caldwell, Idaho, Caxton Printers, 1937). For a valuable review of this book, see E. B. Swanson in *Minnesota History*, 19:203-205 (June 1938).

⁶ In this discussion of diaries and account books, the author is indebted to R. C. Loehr, "Some Sources for Northwest History: Minnesota Farmers' Diaries," *Minnesota History*, 18:284-297 (September 1937). The quotations are on p. 297. This article also appeared with the title, "Farmers' Diaries; Their Interest and Value as Historical Sources," in *Agricultural History*, 12:313-325 (October 1938). See also S. J. Buck, ed., "Making a Farm on the Frontier; Extracts from the Diaries of Mitchell Young Jackson," *Agricultural*

The utility of farmers' letters, especially if available as a fairly continuous series to individuals who were interested in knowing about farming and rural conditions in the community of the writer, is demonstrated by the printed collections that are available. Especially is this true of the so-called American letters which the students of Scandinavian and German immigration have gathered in Europe.⁷ More attention should be given to letters from the frontier to the older settled parts of America. An example is the letters which John Ise of the University of Kansas discovered and made available under the title, *Sod-House Days*.⁸ In this series, Howard Ruede, a homesteader, sought to draw a careful and graphic picture of conditions in central-western Kansas during the 1870's for the information of his family back in Pennsylvania. The hardships of pioneering in the plains country are portrayed, and first-hand information is given on the status of agriculture at a time when the seeds of agrarian discontent which blossomed at the end of the century were taking root.

Reminiscences and memoirs constitute a source which is frequently dismissed as unreliable. Granting their limitations, their preparation and preservation should be actively encouraged. When historians discuss the realities of migration and pioneering—especially the reasons for migration and the choice of community and type of land—they often express regret that this step was not taken with the experiences of their own parents or grandparents, and this reaction indicates an appreciation of their value. In a radio broadcast on the blizzard of 1888, the extension service of the North Dakota Agricultural College invited old-timers to send in their recollections, and some interesting material was assembled as a result.⁹ Perhaps historical societies and similar agencies should follow this experiment. The use of reminiscences in creating backgrounds in rural fiction should also be pointed out.¹⁰

History, 4:92-120 (July 1930); J. L. Davies, "The Diary of a Cardiganshire Farmer, 1870-1900," *Welsh Journal of Agriculture*, 10:5-20 (January 1934); C. M. G[ates], "Some Sources for Northwest History; Account Books," *Minnesota History*, 16:70-75 (March 1935); [Mrs. K. B. Legge], "The Importance of Farm and General Store Account Books in Business History," *Business Historical Society, Bulletin*, 5(2):12-14 (February 1931); "Agricultural Records in the Baker Library," *ibid.*, 9:60-63 (June 1935). For a revelation of how old account books can be made to live, see G. E. Fussell, ed., *Robert Loder's Farm Accounts, 1610-1620* (London, 1936); and I. F. Grant, *Every-Day Life on an Old Highland Farm, 1769-1782* (London, 1924).

⁷ See, for example, Joseph Schafer, "Immigrant Letters," *Wisconsin Magazine of History*, 16:211-215 (December 1932), and the use made of American letters in T. C. Blegen, *Norwegian Migration to America, 1825-1860* (Northfield, Minn., 1931) and G. M. Stephenson, *The Religious Aspects of Swedish Immigration* (Minneapolis, 1932).

⁸ Howard Ruede, *Sod-House Days: Letters from a Kansas Homesteader, 1877-78*, edited by John Ise (Columbia University Studies in the History of American Agriculture, edited by H. J. Carman and R. G. Tugwell, 4. New York, 1937). For another interesting illustration, see A. V. House, Jr., ed., "Two Yankee Traders in New York; Letters on the Financing of Frontier Merchants, 1808-1830," *New England Quarterly*, 11:607-631 (September 1938).

⁹ Letter from Dean H. L. Walster to E. E. Edwards, Jan. 19, 1938.

¹⁰ The accuracy of backgrounds in rural fiction is discussed in L. G. Davis, "The Study of Pioneer Life: A Communication," *Minnesota History*, 10:430-433 (December 1929);

A superb example of the utility of personal reminiscences is available in John Ise's *Sod and Stubble*, an account of farming experiences in the plains country of Kansas which is built from his mother's recollections, supplemented by those of other pioneers and information gleaned from local rural newspaper files. Grasshopper plagues, prairie fires, droughts, dust storms, and the accidents, illnesses, and deaths of humans and livestock constitute a large part of the narrative. In the words of Professor Ise, "It is a story of a grim and tenacious devotion that never flagged until the long, hard task of near a lifetime was done."¹¹ The volume is not only a valuable contribution to agricultural history but a great human document for general American history.

The second group of records to be discussed are those produced by institutions and organizations of the rural community. The account books of country stores, mills, elevators, stockyards, tobacco warehouses, cotton gins, and similar businesses are basic sources and constitute an important means by which the social scientist, be he historian, economist, or sociologist, can glean the realities of the development of the various agricultural regions as well as that of the Nation as a whole. These records furnish data which indicate the course of rural standards of living; they reflect the influence of the competition of the various agricultural sections, the shifts and variations in crop and livestock production, and the changes in systems of farm management. They give the prices paid for groceries and clothing, machinery, fertilizers, twine, and other supplies, and the prices received for agricultural products. The country-store records afford information on the spread between rural and city prices and the changing margin between cost and selling prices.

Rural newspapers constitute community diaries, and like those of individuals, have similar values and weaknesses as a historical source. They customarily chronicle the activities of individuals and the unusual rather than the commonplace or accepted ways of rural life, and the bulk of the organized data on businesses like creameries, cheese factories, elevators, and stockyards appear in anniversary numbers which are sometimes based on the local business records but more often on reminiscences or haphazard investigation. Usually the community must have gained an acknowledged leadership in some particular phase of agriculture before such events as the introduction of new varieties of grain or breeds of livestock are reported. Northfield, Minnesota, for example, prides itself on being the Holstein-Friesian capital of America, but it was only after this eminence was well on the way toward achievement that its papers began to report developments relating to the breed in the community.

Frequently metropolitanopolitan newspapers with a large rural circulation, especially their Sunday editions, have more information of value to historians of rural

Einar Hoidale and J. H. Klovstad, "The Study of Pioneer Life: Two Replies to Mr. Davis," *ibid.*, 11:63-74 (March 1930); John Talman, "The Study of Pioneer Life: A Communication," *ibid.*, 185-187 (June 1930). For a general survey, see C. B. Sherman, "The Development of American Rural Fiction," *Agricultural History*, 12:67-76 (January 1938).

¹¹ John Ise, *Sod and Stubble: The Story of a Kansas Homestead*, preface (New York, 1938).

America than do local newspapers. The classic example is the New York *Tribune* during the editorship of Horace Greeley, and a contemporary example is the *Minneapolis Sunday Tribune* which has carried at least one full-page article, and occasionally many more, depicting current agricultural conditions, practices, and developments in Wisconsin, Minnesota, Iowa, the Dakotas, and Montana, for nearly two decades. Fortunately the better-equipped and more farsighted of the State historical societies have sedulously collected and promoted the use of the rural newspapers that come within their sphere of interest.¹²

A word must also be said concerning the proceedings of local agricultural clubs of various kinds. Apparently little attention has been paid to them by manuscript collectors, and yet they often have buried within them the story of the farmers' efforts to solve their problems by collective thinking and action. Their utility is illustrated by the study of the tedious but crucial trial-and-error adaptation of the Eastern agricultural system to the sub-humid environment which James C. Malin was able to make by using the minutes of a township farmers' club.¹³ Similar studies, based on such records as the minutes of the North Star Grange at the Minnesota Historical Society, would be useful contributions to American agricultural history.

The rural communities of America have functioned governmentally by towns and counties, and the archives of these political units, therefore, inherently relate to agriculture in many ways. The mortgage, tax, and land-transfer records contribute to an understanding of general economic conditions as well as detailed studies involving these subjects, and the probate records throw light on representative holdings and values of property.¹⁴ Fortunately, the work of the National Survey of County Archives has served to demonstrate to local custodians the utility of more careful attention to these records.

We come now to the third group of records, namely those relating to the forces in the Nation that have reacted on the farmer and his community. These forces include colonization and settlement, land policies and systems of land-holding and labor, equipment of all kinds, marketing and financing, political activities, and the agencies that have disseminated knowledge of improved methods to agriculture and rural life. Not all of the records relating to these

¹² For supplementary consideration of newspapers as a source, see R. B. Eide, "Minnesota Pioneer Life as Reflected in the Press," *Minnesota History*, 12:391-403 (December 1931); C. L. Weicht, "The Local Historian and the Newspaper," *ibid.*, 13:45-54 (March 1932); and Joseph Schafer, "A File of Old Newspapers," *Wisconsin Magazine of History*, 8:454-458 (June 1925).

¹³ J. C. Malin, "The Adaptation of the Agricultural System to Sub-Humid Environment; Illustrated by the Activities of the Wayne Township Farmers' Club of Edwards County, Kansas, 1886-1893," *Agricultural History*, 10:118-141 (July 1936).

¹⁴ For further considerations of local archives, see H. H. Burbank, "Local Tax Records as Economic Documents," *Business Historical Society, Bulletin*, 1(9):9-11 (September 1927); Ruth Crandall, "Hidden Treasure in Old-Time Taxes," *ibid.*, 11-15; C. M. Gates, "Some Sources for Northwest History; Probate Records," *Minnesota History*, 17:189-193 (June 1936); G. L. Nute, "Some Sources for Northwest History; Minnesota County Archives," *ibid.*, 15:194-199 (June 1934).

forces will be discussed in detail in this paper as some of them are already generally known or considered elsewhere.

In connection with colonization and settlement, attention is called to the useful generalizations which Joseph Schafer has been able to supply in his *Wisconsin Domesday Book* series by analyzing the descriptions of land made by the original surveyors and by geological and soil surveys, the land-office records of entries which show when, where, and by whom the land was taken, and the manuscript census returns on individuals, farms, and industries.¹⁵ For the present discussion, his results are significant because corresponding records for practically all of the United States are available.

The history of the policies by which land passed from the Federal Government to individual owners centers in official archives and reports, especially those of the General Land Office. The archives of the Department of the Interior which are in Washington have been carefully inventoried by representatives of the National Archives, and those outside the District of Columbia have been appraised by the WPA Survey of Federal Archives. The history of the policies pursued by the States with reference to the land granted to them by the Federal Government lies buried, for the most part, in their respective archives. The Federal and State archives also contribute considerable information to the more significant subject of how land came into the possession of farmers. They must, however, be supplemented with the business records of land companies, individual speculators, and the railroads which received land grants.

The tangible records for research on farm tenancy and labor are elusive as the terms and conditions concerning them have often rested on gradually accepted local customs and oral agreements. The archives of counties include copies of the leases that have been filed, and there are a number of official publications that are based on the census reports and the findings of commissions and surveys. Nowhere, however, is there a single group of records that give one a grip on the realities of these subjects, and especially is this true of farm labor. Even agricultural periodicals, a source to be discussed later, have relatively little on these matters.

An important factor in the transformation of farming from a simple, pioneer, and largely self-sufficing occupation into a business which produces surpluses for the Nation and the world at large was the introduction of many labor-saving machines. The records relating to their development, manufacture, and distribution are, therefore, an important part of the subject at hand. The preservation of data relating to inventions and patents, including their sale and utilization, has long since become important for the business offices of the extant companies in defending claims, and the almost unlimited opportunities offered to historians and economists may be illustrated by a brief reference to the holdings of the

¹⁵ The materials and technique used in the preparation of the *Wisconsin Domesday Book* are described in Joseph Schafer, "A Rural Life Survey of a Western State," in J. F. Willard and C. B. Goodykoontz, eds., *The Trans-Mississippi West*, p. 291-308 (Boulder, Colo., 1930). For a more specialized consideration of census returns, see C. L. Fry, "Making Use of Census Data," *American Statistical Association, Journal*, 25:129-138 (June 1930).

McCormick Historical Association in Chicago. Utilizing the foresight, diligence, and enthusiasm of its director, Herbert A. Kellar, it has developed a collection of printed, manuscript, and museum materials on a wide range of subjects centering about the activities and interests of Cyrus H. McCormick, the inventor of the reaper, and his family. Included in its manuscript collection which numbers well over a million and a half items are the extensive personal papers of the McCormick family, the earlier ones pertaining to life in Virginia and the later ones to the Mississippi Valley and elsewhere. The voluminous records of the McCormick companies constitute another important group and include letters received and sent, ledgers of orders, sales, and deliveries, cash books, day books, and patent papers—in short, the sources for the continuous and detailed history of the development of a vast international economic organization. These same sources, it may be added, include data concerning the development of manufacturing, advertising, marketing, accounting, cereal production, and the relations of capital and labor, and also the settlement and economic growth of the agricultural regions of America. Illustrations of farm machinery have been given special attention, and the same is true of originals, replicas, and models of the machines which embodied significant technical advances. Other machinery companies have records of like importance which should be made available for research workers.

The records of the many organizations and institutions which have been involved in the marketing of agricultural products deserve similar emphasis, for, in the opinion of leading historians, the development of marketing is the central force in economic evolution. They are the sources for studies of the spread between what the farmer receives and the consumer pays, the various ways by which attempts have been made to increase the farmers' share of the retail price, the multitudinous functions which the Federal and State Governments have been forced to assume on behalf of the farmer in the marketing mechanism, the migration of the processing of products from the farm to the mill, packing house, and factory, and many other similar significant subjects. The records and catalogs of mail-order houses are of special importance in studies relating to rural purchases, and although their bulk is formidable, the day has already arrived when research workers, and especially economic analysts, have to rely on this category of material to a large degree. Representative samples of the business records concerned with marketing and consumption have been gathered by the Business Historical Society and other agencies which have responded to its encouragement and example.¹⁶

The American farmer has frequently sought to better his position by political action, and studies like Solon J. Buck's *Granger Movement* and John D. Hicks's *Populist Revolt* have emphasized the value of the records relating to the various protest movements. More attention should, however, be given to the farmers'

¹⁶ R. M. Hower, "Wanted: Material on the History of Marketing," *Business Historical Society, Bulletin*, 9:79-81 (October 1935) is an example of the appeals which have been made. See also the text of the series of radio broadcasts by the Business Historical Society over Station WBZ, Mar. 13, 1931, Mar. 29, Apr. 5, 1932, and Sept. 23, 1933.

organizations which did not actually culminate in direct political action. Their publications frequently embody proposals and theories which became the leavens and bases for later thought and action. An example is the American Society of Equity whose ideas are in the background of the cooperative movement and the movement for agricultural equality with industry.

Data for studies of the various farm crops and regions are available in practically all of the records here discussed. For all periods, travel literature has much information which can be utilized to good advantage.¹⁷ Solon J. Buck's bibliographical study of the materials for early Illinois pointed the way, and aids like Frank Monahan's list of French travelers' accounts are of much assistance.¹⁸ It may be hoped that the project for a comprehensive bibliography of American travel literature will soon be completed.

Crops and livestock also have a technical history, and in this connection, it is pertinent to call attention to the Department of Agriculture Library's collection of catalogs and other trade publications of nursery and seed businesses. It includes over 62,000 items and is the largest of its kind in the United States. Far from being ephemeral as many may assume, these catalogs are essential to research workers who are concerned with the history, nomenclature, description, and location of fruits, vegetables, and ornamentals. The provenance of a plant as recorded contemporaneously in a seed catalog is often of great value and not readily found anywhere else. Since the 1880's the libraries of the Massachusetts Horticultural Society and Cornell University have also made systematic collections of trade catalogs.¹⁹ The breed books, registers, and journals relating to the various breeds of livestock are of similar value.

More conscious and systematic attention should also be given to pictures of all kinds and actual physical representations of farm life. The tremendous impression of volumes like *You Have Seen Their Faces* and *Land of the Free* serves to emphasize this point.²⁰ In recent years, agencies of the Federal

¹⁷ This subject is considered in R. G. Taylor, "Some Sources for Mississippi Valley Agricultural History," *Mississippi Valley Historical Review*, 7:142-145 (September 1920). For an interesting illustration of the use of travel literature, see H. J. Carman, "English Views of Middle Western Agriculture, 1850-1870," *Agricultural History*, 8:3-19 (January 1934).

¹⁸ S. J. Buck, *Travel and Description, 1765-1865* (Springfield, Ill., 1914); Frank Monahan, *French Travellers in the United States 1765-1932; A Bibliography* (New York, 1933). See also R. W. Kelsey, "Description and Travel as Source Material for the History of Early Agriculture in Pennsylvania," *American Historical Association, Annual Report*, 1920, p. 285-292 (Washington, 1925) and *Agricultural History Society Papers*, 3:285-292 (Washington, 1925).

¹⁹ For further discussion of these collections, see C. R. Barnett, "Horticultural Trade Catalogues," *Agricultural Library Notes*, 1:76-77 (May 1926); D. St. J. Manks, "Trade Catalogues in the Library of the Massachusetts Horticultural Society," *ibid.*, 3:295-296 (October-December 1928); and A. M. S. Pridham, "Collection of Horticultural Catalogues in Cornell University Library," *ibid.*, 4:328 (January-February 1929).

²⁰ Erskine Caldwell and Margaret Bourke-White, *You Have Seen Their Faces* (New York, 1937); Archibald MacLeish, *Land of the Free* (New York, 1938). See also Robert Taft, "A Photographic History of Early Kansas," *Kansas Historical Quarterly* 3:3-14

Government have taken thousands of pictures in the course of their work. Many of these are used in publications to illustrate specific points in reconstruction programs. Too little attention, however, is given to the exact provenance of these pictures, and especially to their preservation as historical records.

Likewise it is important to preserve and restore physical survivals which show just how the rural folk of representative periods and regions lived and farmed.²¹ The restoration of the New Salem of Lincoln's day may well be taken as a model for similar undertakings, and the careful research and diligence of Herbert A. Kellar will make it possible to say the same of the McCormick plantation in the Valley of Virginia. The folk and open-air museums of Europe have an interesting counterpart in the Norwegian-American Historical Museum at Decorah, Iowa, and the work of Russell H. Anderson at the Museum of Science and Industry in Chicago also provides many examples of useful techniques and procedures.

A vast part of the records of the third group center about the gradual development and application of scientific knowledge to agriculture. The media by which this knowledge reached farmers are many, and in the order of their historical appearance, they may be listed as follows: agricultural leaders, agricultural societies and fairs, agricultural periodicals, State boards and departments of agriculture, the United States Department of Agriculture, and the agricultural schools, colleges, and experiment stations.

The term agricultural leaders is here used for the vast array of individuals who have contributed, directly or indirectly, to the improvement of agriculture and rural life. The first in America were for the most part men of affairs like Franklin, Washington, Jefferson, and Clay whose farming interests were subsidiary, whatever their professed inclinations may have been, and a long list of agricultural editors and writers, inventors, scientists, promoters of protest movements, and agricultural officials followed.²² The papers of these men, a considerable number of whom are not in the *Dictionary of American Biography*, should be sought out and developed as collections for use in research. The little known Daniel Lee whose life span covered most of the nineteenth century will serve as an example. He was editor of the *Genessee Farmer* in New York, director of the division of agriculture in the Patent Office, and agricultural teacher and editor in Georgia and Tennessee. So far as agriculture is concerned, his thinking presaged the New Deal in a number of respects.

The analysis by Rodney H. True of the thirty-nine letters in the Yale University Library that were addressed to Jared Eliot as a result of his essays on

(February 1934); and J. G. Williams, "Recording Local History in Pictures," Ontario Historical Society, *Papers and Records*, 29:117-120 (1933).

²¹ E. E. Edwards, "References on Agricultural Museums," U. S. Department of Agriculture, Library, *Bibliographical Contributions* 29 (Washington, D. C., 1936).

²² For an interesting illustrative collection of letters and other records by political leaders which relate to agriculture, see E. E. Edwards, ed., *Washington, Jefferson, Lincoln and Agriculture* (Washington, 1937).

field husbandry in New England indicates the value of such collections.²³ Because of the attention which his essays received, Eliot became a sort of clearing house of information for those who cared to exchange ideas on farming.

The letters by Solon Robinson, that veritable Arthur Young of mid-nineteenth-century America, which have been brought together and edited in a superb manner by Herbert A. Kellar, illustrate even more forcefully the importance of this type of material.²⁴ Written by an acute observer, these letters, many of which were prepared for contemporaneous publication in agricultural periodicals, are a treasure chest of historical data on all phases of American life, including agriculture.

The records of the agricultural societies are likewise important. With one or two exceptions, the first series of societies, beginning with the Philadelphia Society for Promoting Agriculture in 1785, hardly reached actual dirt farmers, yet their efforts in the form of pamphlets devoted to contemporaneous methods in Europe and America did much to pave the way for translations, American adaptations, and original treatises on agriculture.

An annotated bibliography of these agricultural works—arranged chronologically as well as alphabetically—would be a great boon to agricultural historians. It would begin with Jared Eliot's *Essays Upon Field Husbandry in New England* (1760), the anonymous *American Husbandry* (1775), and John Spurrier's *Practical Farmer* (1793) and should continue to the latter part of the nineteenth century when the agricultural colleges had delineated their curriculums and begun to provide textbooks for their courses. Buried within these volumes is the scientific and folk knowledge relating to agriculture which was then current in America. Preparation of such a list would involve a search of the catalogs of agricultural libraries, especially that of the United States Department of Agriculture, compilations like Joseph Sabin's *Dictionary of Books relating to America*, and the imprint studies that are now appearing as a result of Douglas C. McMurtrie's talented and energetic efforts as director of the American Imprints Inventory.

The activities of the second and later series of agricultural societies owed their inspiration and impetus to Elkanah Watson and center about the agricultural fair, that great American institution which has played such an important rôle in popular education and diversion. These societies were usually organized by counties, and the value of their records is illustrated by the printed version of the minutes of the Albemarle Agricultural Society.²⁵ They show how an

²³ R. H. True, "Some Pre-Revolutionary Agricultural Correspondence," *Agricultural History*, 12:107-117 (April 1938).

²⁴ H. A. Kellar, ed., *Solon Robinson, Pioneer and Agriculturist; Selected Writings* (Indiana Historical Collections, v. 21-22. Indianapolis, 1936).

²⁵ R. H. True, ed., "Minute Book of the Agricultural Society of Albemarle," American Historical Association, *Annual Report*, 1918, p. 263-349 (Washington, 1921), and *Agricultural History Society Papers*, 1:263-349 (Washington, 1921). See also R. H. True, "Early Days of the Albemarle Agricultural Society," American Historical Association, *Annual Report*, 1918, p. 243-259 (Washington, 1921), and *Agricultural History Society Papers*, 3:243-259 (Washington, 1921).

organized group of farmers sought to spread a knowledge of the means of resuscitating and improving the agriculture of the community which contributed Jefferson and many other eminent leaders to the Nation.

The early State boards of agriculture usually consisted of representatives from the county agricultural societies which stemmed from Watson's efforts. The main function of these boards was the publication of annual and other reports which constitute an important, but little used, source of data on agricultural and rural conditions during the 1840's, 50's, 60's, and 70's. In this instance, not only a list but a comprehensive author, subject, and regional index is needed. The Library of the United States Department of Agriculture undertook to prepare such a key some years ago, but has not been able to complete the project.

Next in chronological order of origin come agricultural periodicals, and by way of introduction to this brief discussion of them, it may be stated that they probably constitute the most important of the sources here considered, not only for those who are interested in strictly agricultural history but for the general historian as well.²⁶ Their history begins with the *Agricultural Museum* which was inaugurated at Georgetown, D. C., on July 4, 1810, and continues to the present day. The number of these periodicals is legion, and the subjects for which they supply data are correspondingly numerous. Recalling again the significance of agriculture and its accompanying rurality as a central theme in American history, it is logical that research workers should give more attention to the periodicals which were consciously designed to serve as the main clearing house for information relating to agriculture and rural life. Each editor had his own ideas of the particular mission of his paper; each decade brought forth new problems and interests; and each generation of readers had to be approached in a different way, therefore, there is considerable variation in the contents of this source.

If copies or microfilm enlargements of the farm journals relating to a specific geographical region, such as a State, could be cut up, even figuratively speaking, into articles, editorials, news items, advertisements, etc., and the resulting notes arranged chronologically according to subjects in a classified file the result would be a veritable source history of the evolution of rural life and thought in that region, together with countless sidelights on its general economic, social, and political history. Even a comprehensive and carefully cross-referenced index to a complete collection of the journals dealing with specified regions would go a long way toward serving the same end. At least the outstanding journals like John Stuart Skinner's *American Farmer* and Edmund Ruffin's *Farmers' Register* which are representative of their period and region should be so handled. Such indexes might well be prosecuted as a WPA project in a manner similar to the indexes of metropolitan newspapers.

Research workers should be provided with a complete list of these periodicals,

²⁶ Agricultural periodicals as a source are discussed in more detail in E. E. Edwards, "Some Sources for Northwest History; Agricultural Periodicals," *Minnesota History*, 18:407-414 (December 1937).

arranged geographically and alphabetically, with annotations indicating the publication dates and forms, editors, and holders of the main files. The unpublished "List of American Agricultural Journals" which was prepared by the late Stephen Conrad Stuntz in anticipation of the fiftieth anniversary of the United States Department of Agriculture fills some of these specifications. It is now owned by the Department Library which has done some work looking toward its publication. Here again, however, lack of assistance has deprived scholars of a valuable tool which would aid in the exploitation of this source. Perhaps a union catalog of the sort needed could be completed with WPA assistance.

From the voluntary activities of one man, Henry L. Ellsworth, who sought to provide a national clearing house for agriculture, the United States Department of Agriculture has evolved into a vast institution which consciously and concretely serves every community in America. Official summaries of its activities have appeared in many published forms. Its archives in Washington have been carefully examined by representatives of the National Archives and certain of the non-active material has already been transferred to its custody. Similarly the WPA Survey of Federal Archives has checked the files of the Department which have accumulated in its field offices. The reports of this survey are making the whereabouts and contents of these archives more generally known. It should also be pointed out that the archives of other Federal agencies are frequently directly related to agriculture. Those of the United States Food Administration and the United States Grain Corporation are an example.²⁷

After the trial-and-error experiments of many institutions and movements during the 1840's, 50's, and 60's, the Nation has come to be served by the agricultural colleges and experiment stations of today. The archives and publications of these institutions are part of the subject here discussed, and their preservation for active use should be encouraged. The State historical societies would do well to give attention to the records of the institutions and agricultural-education movements which have long since died, and the land-grant colleges and experiment stations should preserve their records in a systematic manner. Doing so would facilitate evaluations of their contributions to science and the betterment of rural life.

Many agricultural records of the character here delineated have been located through the activities of the Historical Records Survey, and consequently the various agencies that are specializing in their collection, preservation, and use have a new and unusual opportunity to intensify their efforts. With the possibilities now afforded by microphotography, a national clearing house could do much to make many of these records available at the Federal Capital and other research centers as well as in the locality which produced them.

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²⁷ See, for example, C. L. Guthrie, "The United States Grain Corporation Records in the National Archives," *Agricultural History*, 12:347-354 (October 1938).

ECONOMIC RECOVERY AND THE WHEAT CROP OF 1897

GERALD T. WHITE

At the middle of the year 1897 the pall of economic depression in the United States seemed almost as overwhelming as at any time since the outbreak of the panic in 1893. There had been few rifts in the blackness. During the spring and summer of 1895, a revival which reached its high point in the iron and steel industry had proven abortive, perhaps because of a too rapidly rising price level. After the intense political campaign of 1896 was over, the momentary industrial activity resulting from a flood of pent-up orders caused an illusion of recovery, but it was soon dispelled.

After making a survey of the contemporary industrial scene, the *Bulletin* of the American Iron and Steel Association for June 1897 reported in an editorial entitled "The Hard Times Still Continue" that, "Reductions in prices and earnings and reductions in wages are still the order of the day." Near the end of the same month, *Bradstreet's* commented, "There is no boom and has been none in any staple commercial or industrial line this year or in any preceding year since the panic of 1893." In fact, its weekly survey indicated that, except for certain western cities, trade conditions in the latter part of June seemed less satisfactory than those of two or three months previous. The *Commercial & Financial Chronicle*, while not so pessimistic, was sure that no great improvement had been made.¹

Senator Mark Hanna, the generalissimo of the Republican prosperity campaign of 1896, speaking as a mine owner at the time of the great bituminous coal strike of 1897, said that, "Owing to the existing conditions of business, no one can be expected to raise wages anywhere in any line of business, and therefore the strikers have chosen a very unfortunate time to make their demands, whether the latter be reasonable or not."² The distinguished economist, J. Laurence Laughlin, in a survey article on the contemporaneous situation, found no immediate promise of prosperity. In his opinion the fear of free silver was but temporarily abated as no remedial legislation had been enacted, and industry was prostrate and could not be expected to revive at once.³

Yet, despite these general indications of pessimism, visible economic recovery was well advanced and well publicized by the close of 1897. The con-

¹ American Iron and Steel Association, *Bulletin*, 31:133 (June 10, 1897); *Bradstreet's*, 25:402 (June 26, 1897); *Commercial & Financial Chronicle*, 65:2 (July 3, 1897).

² N. Y. *Herald*, July 6, 1897, p. 5.

³ J. Laurence Laughlin, "The McKinley Administration and Prosperity," *Forum*, 23:554-563 (July 1897). On the essential basis for recovery he declared, "Not until some branch of production (perhaps agriculture) gains new purchasing power, does the growing demand, increasing concurrently with production, spread in ever-widening circles to many occupations,—until, finally, all available capital and labor find employment in new adjustments."—p. 556.

temporaneous reports were almost unanimous in the opinion that this recovery had first appeared in the West, but it was also reported, to a lesser extent, in the East. In certain highly partisan circles attempts were made to attribute this recovery to the Dingley Tariff Act of July 1897, for a fundamental tenet of the Republican campaign propaganda of 1896 had been the restoration of a high protective tariff as the main essential for renewed prosperity. A more dispassionate opinion attached some significance to the rapidly developing and sizeable foreign markets for American manufactures. Beyond all other factors, however, much emphasis was placed upon the relationship of the profitable marketing of the large American wheat crop of 1897 to the recovery then being experienced. To show the basis of this emphasis and the extent of its expression is the primary concern of this article.

Stressing the importance of an agricultural impetus to national prosperity was not unnatural. It was to be expected in rural areas, but a background for the significance with which the profitable marketing of the wheat crop of 1897 was regarded also existed elsewhere. Although the industrial and creditor elements in the North and East had refused to have anything to do with the agrarian panacea of free silver as the cure for depression, they nevertheless placed much emphasis upon the essential bearing of agricultural recovery on national recovery. The Census of 1890 showed that approximately three-eighths of the gainfully employed were engaged in agriculture—a considerably larger number than those engaged in manufacturing and mechanical pursuits. Furthermore, over half of the American people still lived in unincorporated villages or on farms.⁴ An evident conclusion was that a substantial, if not a major portion of the American home market was located among those people directly involved in agriculture or closely associated with it.

Throughout the depression, eastern newspapers, trade journals, financial magazines, and reports of chambers of commerce expressed a serious interest in the prospects of agriculture and increasingly emphasized agricultural prosperity as the essential key to restored national prosperity. The ultra-protectionist *Textile Record*, for example, admitted in the spring of 1894, that "Tariff or no tariff, this country can have no real prosperity if the farmers are to be impoverished by continuously falling prices." It stated further that "when about forty per cent. of the population is selling wheat, cotton, wool and other materials at or below cost, it is inevitable that their purchasing power must be so reduced that every commercial interest dependent upon their ability to buy must be injured."⁵ A year later the American correspondent of the London *Economist* declared, "It will be useless for industrial workers, and likewise for those engaged in purely commercial enterprises, to look for a revival of demand and a continuance thereof, till those who are nearest the soil, who raise our surplus food products and textile materials, find the skies brighter and

⁴ U. S. Census, Twelfth Census, 1900, *Population*, 1(1):lxxxix; 2(2):cxxxiii.

⁵ *Textile Record*, 14:155 (March 1894).

quotations improved."⁶ Numerous other statements of similar import are available.⁷

Such expressions of opinion in terms of the political campaign of 1896 might seem more in keeping with the sentiments of a rabid western silver sheet than of an eastern trade or financial journal. The difference was, however, that, notwithstanding the heavy emphasis laid on the importance of agricultural prosperity to national prosperity in the East, no important eastern element was willing to agree to the remonetization of silver in order to bring it about. For the East, agricultural prosperity would have to return under the gold standard. Low farm prices might be deemed abhorrent, but any real improvement could come only through the operation of natural economic factors.

In the fall of 1897, the improvement in agricultural conditions, for which many Easterners as well as Westerners had been hoping, finally occurred. It was not caused by the operation of any monetary panacea, but rather by circumstances whereby the large American wheat crop of 1897 found a profitable market. As the result of the news of impending crop disasters in India, Australia, and Argentina, and of the probability of a larger share of the world wheat market for the American farmer, the price of wheat had moved steadily upward during the fall months of 1896. This foretaste of prosperity developed into reality during the following year. The American wheat farmers, favored with one of the largest crops in history, were able to export their ordinarily burdensome surplus at high prices to a world market impoverished by an almost universal shortage of grain crops.

In the early months of 1897, reports from American consuls and correspondents to American trade and agricultural journals confirmed the extent of the crop failure in the Southern Hemisphere. In December 1896, the American consul at Sydney, Australia, reported that instead of the usual Australian wheat surplus of some 12 million bushels, a deficiency of some 5 million bushels was expected. This deficiency in the world market would have to be supplied in great part from the United States.⁸ An Argentine correspondent of the *Northwestern Miller* wrote of the unprecedented plague of locusts which had decimated the wheat crop and forced the Argentine Government to take active measures for the relief of the impoverished farmers.⁹ In February 1897, the American consul at Bombay wrote that the wheat crop planted in November 1896 was about 25 percent less than normal because of insufficient rainfall. He prophesied an even shorter crop for India than that of the previous unhappy season.¹⁰

⁶ *Economist*, 53:488 (Apr. 13, 1895).

⁷ See *Banker's Magazine*, 48:406 (December 1893), 48:649-650 (March 1894); *Engineering Magazine*, 7:3 (April 1894); *Dun's Review*, 2(62):1 (Oct. 6, 1894); *N. Y. Herald*, Nov. 16, 1894, p. 8. Cyrus Adler, in his biography of *Jacob H. Schiff*, 1:29 (New York, 1928), observed that that distinguished financier in general considered crop conditions as "the determining factor" in the presence or absence of national prosperity.

⁸ *U. S. Consular Reports*, 53:357 (Dec. 1, 1896).

⁹ *Northwestern Miller*, 43:23, 504-505 (Jan. 1, Apr. 2, 1897).

¹⁰ *U. S. Consular Reports*, 54:225-226 (Feb. 10, 1897).

As the year 1897 advanced, these reports of crop disasters were repeated with greater significance from the major wheat-producing countries in Europe. At the end of July the American consul-general at Frankfurt reported the German wheat crop by government rating as from "fair" to "scanty." The yield of the rye crop was as bad. In Austria-Hungary the wheat crop, damaged by excessive rainfall, was reduced approximately one-third, and the rye crop almost one-half. Similar damage was reported from the Balkan countries of the lower Danube basin. In early August the American consul at Odessa wrote that "in many districts the rain and hail completely destroyed the ripe and unripe grain." The Russian crop, which was reduced about one-third, would allow little if any wheat for export. In France, which ranked next to the United States and Russia among wheat-producing nations, the crop of 1897 was also reduced one-third as the result of heavy spring and autumn rains. The crop in Italy was reduced by one-half.¹¹

In sum, while the wheat yield of the United States for 1897 was 530 million bushels and more than 15 percent larger than the average of the past five years, and its other grain crops were also excellent, the world grain crops were poor. The European and Asian wheat crops were about one-third less than normal.¹² Inasmuch as 1896 had been a somewhat unsatisfactory year in the world production of grain crops, with stocks of held-over grain slight, the American grain farmer found the disposition of the unusually large export surplus no burden.

The importance of the relation of the world agricultural situation in 1897 to American prosperity grew upon public consciousness as the harvest season for American grain progressed. As early as June 22, President McKinley was informed by Frank Thomson of the Pennsylvania Railroad that his lines west of Pittsburgh had experienced an average daily freight-car movement for the early part of June which was 10 percent better than for the same period in May 1897. As the new large crops moved to market in quantity, he looked forward to a "decided improvement by the autumn" in general business.¹³

In early July the good feeling with respect to the future prosperity of rural America spread widely. *Bradstreet's*, in its issue of July 10, 1897, drew a common historical parallelism between the recovery in 1879 and the current scene, for, as in 1879, it looked as if the coincidence of superb American crops in the face of foreign failures would usher in a period of renewed prosperity. Concerning the great American wheat crop it declared:¹⁴

This brings the United States to the front as a prominent wheat exporter under somewhat similar conditions to those which existed in 1879, a period of revival from the preceding

¹¹ *Ibid.*, 55:118-119 (July 27, 1897), 432-433 (Aug. 9, 1897), 433-434 (Sept. 15, 1897). In May 1898, France removed its duty on imported wheat for two months because of the extent of the shortage.—*Ibid.*, 57:392 (May 4, 1898).

¹² U. S. Department of Agriculture, *Yearbook*, 1897, p. 717-718.

¹³ Letter from Thomson to McKinley, June 22, 1897, McKinley MSS. (Manuscripts Division, Library of Congress).

¹⁴ *Bradstreet's*, 25:434, 436 (July 10, 1897). See also *N. Y. Herald*, July 19, 1897, p. 12;

great panic, after five or six years of retrenchment and economy. At that time European supplies of wheat were very generally short and those in the United States unusually bountiful. We had passed through the period of recuperation following that of over-inflation and speculation, even as we have within the last four years. The most encouraging feature of the situation to-day, then, is found in the advancing price of wheat during the harvest season.

At the end of July, though expressions of opinion might be divided and partisan with respect to the effect of the operation of the Dingley tariff upon prosperity, opinion as to the importance of the new grain crops was almost unanimous. Such trade journals of high tariff sympathies as the *Iron Age* and the *Iron Trade Review* joined, as did the American Iron and Steel Association in its current annual report, in stressing the importance of the grain crops. The *Iron Age* stated, "While it will not do to underrate the far reaching effects of the passage of the tariff bill, we believe that the developments in the near future will be most powerfully shaped by the very favorable crop situation." They saw resulting from renewed farm prosperity "a stimulation of all branches of trade and industry." Railroads would profit in consequence of the increased traffic in agricultural and other products.¹⁵ Industry would profit, for beyond the opportunity to pay off debts, the substantial renewed farm income would permit large-scale purchases of wagons, plows, reapers, and wire fencing, as well as goods for immediate consumption.¹⁶

In these expressions of confidence in the development of renewed prosperity a number of newspapers that had supported Bryan and free silver in 1896 also made known their agreement. The *St. Louis Republic*, while ignoring the newly passed tariff, declared, "The big crops will soon begin to move to market, and then will follow a reopening of the mills and shops in the cities. A degree of prosperity is thus assured to the whole nation and to all of its varied and diversified industrial and commercial interests."¹⁷ The *Denver News*, without reckoning the effect of the expected agricultural prosperity upon the argument for free silver, pointed to its gradual emergence as a substantiation of the agrarian point of view that prosperity must first appear on the farm.¹⁸

Iron Trade Review, 30(29):6 (July 22, 1897); *Economist*, 55:1144 (Aug. 7, 1897); *Banker's Magazine*, 55:292-293 (August 1897); *N. Y. Post*, Aug. 21, 1897, p. 2. In his *Recent Economic Changes*, 6-8 (New York, 1889), David A. Wells considered the coincidence of foreign failures at a time of superb grain crops in the United States as the major reason for economic recovery in 1879-81.

¹⁵ U. S. Industrial Commission, *Final Report*, 6:37 (Washington, 1900-02) states that one-third of the freight-ton mileage of the Nation's railroads was grain traffic. The granger roads, such as the Chicago, Burlington & Quincy, the Chicago & Northwestern, and the Chicago, Milwaukee & St. Paul, were among those which made the largest gains in the fall advances of 1897 on the New York Stock Exchange. See the *N. Y. Herald*, Jan. 2, 1898, sect. 2, p. 5.

¹⁶ *Iron Age*, July 29, 1897, p. 17; *Iron Trade Review*, 30(29):6 (July 22, 1897); American Iron and Steel Association, *Annual Statistical Report*, 1897, p. 17-18 (Philadelphia, 1898).

¹⁷ *St. Louis Republic*, July 24, 1897, p. 4.

¹⁸ *Denver News*, July 26, 1897, p. 4.

In August, as the price of wheat climbed steadily upward toward one dollar per bushel—the figure so deeply imbedded in the agrarian oratory of the 1890's—the rise was chronicled by nearly all newspapers with little regard to party or geographic location. No doubt the newspapers and journals of the North and East were also expressing an ulterior pleasure in the chain of events which they hoped would break down the disturbing agrarian argument for free silver. As wheat continued to rise, silver showed no parallel increase in price; in fact, it even declined slightly.¹⁹ Nevertheless, the pleasure to the North and East was also immediate, for upon the expectancy of renewed agricultural prosperity they based their own hope of prosperity to a greater extent than upon any other single factor.

So turbulent and speculative had been the wheat markets that cash wheat went above one dollar per bushel on August 20 in the major markets, almost regardless of location. In recording the event, the *Kansas City Star* stressed its importance to railroads, manufacturers, and bankers, as well as to farmers, and concluded, "Thus the prosperity of the farmer spreads over the land like a benediction, reaching every locality and every department of business."²⁰ The *New York Herald* devoted almost its entire front page to the event and declared that it assured prosperity at last.²¹ To the *New York Journal of Commerce*, dollar wheat was "The event of the week and indeed the event of the year."²² In Chicago, where the fact was of even greater importance, it received still more news attention. The *Chicago Tribune* inaugurated a policy, continued for two months, of publishing weekly maps of the spring and winter wheat regions and the corn region which were illustrative of crop prices and conditions.²³ In Minneapolis, the rise of wheat above one dollar per bushel was heralded in lusty western fashion with an invasion of the Board of Trade by C. A. Pillsbury at the head of a big band. Within a week he ventured to predict at a banquet of millers that No. 1 Northern wheat at Minneapolis would average above one dollar per bushel for the crop year. In this bullish prediction he was not far wrong.²⁴

Beside the jubilant atmosphere in news stories, editorials, and feature articles devoted in great part to recovery in Populist Kansas, numerous men in public office expressed their opinion of the extent and importance of the new agricultural prosperity. The enterprising *New York Journal* interviewed western

¹⁹ *Bradstreet's* 25:465 (July 24, 1897). The new gold discoveries in the Klondike were also treated as an anti-silver argument in this issue, for these would mean an increase in the quantity of money without recourse to the use of silver. See also *ibid.*, 25:484 (July 31, 1897); *Dun's Review*, 4(208):1 (July 24, 1897); *Chicago Tribune*, July 20, 1897, p. 1; Aug. 11, 1897, p. 1.

²⁰ *Kansas City Star*, Aug. 20, 1897, p. 4.

²¹ *N. Y. Herald*, Aug. 21, 1897, p. 3.

²² *N. Y. Journal of Commerce*, Aug. 23, 1897, p. 4.

²³ *Chicago Tribune*, Aug. 21, 1897, p. 1, 2.

²⁴ *Northwestern Miller*, 44:361, 363 (Sept. 3, 1897). According to *ibid.*, 46:341 (Aug. 26, 1898), No. 1 Northern wheat at Minneapolis averaged 97½ cents for the crop year.

governors and mayors by wire in one effort that was widely syndicated. Throughout the two tiers of States west of the Mississippi River and north of the Missouri River, the governors, Populist or otherwise, bore testimony to the return of prosperity within their States. The excellent crops and high prices were the subjects of almost universal optimistic comment.²⁵

The New York *World* published a feature article on the relationship of dollar wheat to prosperity each Sunday for four weeks in late August and September. This series was republished in thirty daily newspapers and some three thousand weekly papers. Richard P. Bland and William Jennings Bryan, silver Democrats, and Thomas B. Reed and Nelson Dingley, Republicans, formed the symposium.

In the first two articles, Bland and Bryan, as advocates of a cause which had not yet achieved success, confined themselves closely to the silver question. They declared that the current price of wheat was attributable solely to foreign crop failures, and that such failures could not be depended upon to give the American farmer the high prices needed for his prosperity. They claimed that the rise in wheat prices, far from undermining bimetallism, strengthened it. The benefits temporarily accruing from higher prices suggested to the farmer the advantages that would be his were prices raised universally and equally by bimetallism. When this breath of prosperity passed, as they were sure it would, bimetallism would be strengthened by specific example of the importance of higher prices. Premising their faith in the future of bimetallism on the belief that the current farm prosperity could not last, they prophesied, "Wait and see the result."²⁶

Speaker Reed approached the subject in a more detached manner. He held that panics are natural and periodic and have to work themselves out. After a great crisis, "there is nothing to do but wait and let the business of the world settle itself, carefully keeping meanwhile the medicine men of finance with their feathers and rattles out of the way of the sick man." In time business becomes readjusted: "Wheels begin to turn, freight begins to move, commerce resumes her full sway, one by one each employment takes up its march and the nation as a whole goes to work again." Differing with Bland and Bryan as to the importance of the improved wheat prices, he likened their effect to the first push on the pendulum of a wound-up clock. "The returns from the wheat crop and the other cereals spent in purchases starts [*sic*] the nation to work. When the nation once goes to work, it will not stop until it gets out of gear again, and then it will halt, and then it will go on again, a succession of like events forever and forever."²⁷

As for Representative Dingley, the wheat crop was of no particular importance to him. He felt that it was "more than a coincidence" that depression

²⁵ N. Y. *Journal*, Aug. 20, 1897, p. 1; *Chicago Tribune*, Aug. 21, 1897, p. 3; *St. Louis Republic*, Aug. 20, 1897, p. 3.

²⁶ N. Y. *World*, Aug. 29, 1897, p. 1, 2; Sept. 5, p. 1.

²⁷ *Ibid.*, Sept. 12, p. 1, 3.

had followed the inauguration of a President who opposed the Republican tariff policy. The recovery which he professed to see in the East was merely the result of the restoration of a high protective tariff by the measure which bore his name.²⁸

Though the sensation caused by the wheat crop wore off in September when the price slipped from its pinnacle and did not rise above one dollar at Chicago until early in December, the general effect was continuous. The price remained above that figure almost constantly after December, aided in part by the speculative activities of Joseph Leiter, who was aiming at a corner in wheat. On May 10, 1898, it went to \$1.91 per bushel at Chicago, but such a momentary price near the close of a crop year was unimportant to the farmers.²⁹ The steady and large export demand for wheat reacted favorably on the prices of other grain crops, particularly corn. During the fiscal year ending June 30, 1898, the total value of exports of wheat and flour was approximately \$214,000,000. This valuation may be compared with \$115,000,000 and \$91,000,000 in the two preceding years. As for corn, exports amounted to more than 10 percent of the total crop for the first time in American history and added another \$75,000,000 to the farmers' income.³⁰

The extent to which these higher prices raised farm income is a subject for scientific determination. According to an estimate made at the end of August 1897 and attributed to Assistant Secretary of Agriculture J. H. Brigham, the increase over the preceding year would amount to from \$400,000,000 to \$500,000,000.³¹ As any such increase in farm income was the result of the sale of American farm products abroad, it was also of importance in the creation of the heavy gold imports of the fiscal year 1898. In that year, partially as the result of an extraordinarily favorable trade balance, gold imports of nearly \$105,000,000 entered the United States.³² This influx of gold naturally afforded an excellent base for increased credit expansion. Perhaps even more important to recovery than the gold imports were the general psychological effects of the consciousness of the renewed rural purchasing power and the possible end of the alarming silver monetary heresy.

Regardless of the exact amount of the increase in farm income, its presence was evident throughout the fall of 1897. The western farmers used their new income not only to pay off burdensome mortgages,³³ but also to make heavy

²⁸ *Ibid.*, Sept. 19, p. 1, 2.

²⁹ N. Y. *Herald*, Dec. 9, 1897, p. 13, *Dun's Review*, 5(250):4 (May 14, 1898).

³⁰ *Bradstreet's*, 26:452 (July 16, 1898); A. P. Andrew, "The Influence of the Crops upon Business in America," *Quarterly Journal of Economics* 20:337 (May 1906).

³¹ N. Y. *Herald*, Aug. 28, 1897, p. 5.

³² Secretary of the Treasury, *Annual Report*, 1898, p. 430.

³³ *Orange Judd Farmer*, 23:254, 279, 303 (Sept. 11, 18, 25, 1897); N. Y. *Herald*, Aug. 28, 1897, p. 5; Oct. 25, p. 13. Among the more significant exhibits at the Trans-Mississippi Exposition at Omaha in the summer and fall of 1898 was a pyramid of Nebraska and Kansas farm mortgages which had been paid off within the past two years. See *Bradstreet's*, 25:773 (Dec. 4, 1897); U. S. Industrial Commission, *Final Report*, 19:100 (Washington, 1902).

purchases of manufactured goods. Throughout the summer and fall of 1897, the newspapers and trade journals united in finding the most active and best markets for manufactured products in the upper Mississippi Valley. The Populists of the region involved, who, as a party born in depression and with a depression monetary argument still unenacted, had certainly no reason to welcome returning prosperity, agreed as heartily in the portrayal of western recovery as anyone.³⁴

In the light of these facts and the universality of the interest expressed in the improved conditions in the agricultural West, there seems no reason to doubt that the economic recovery of the United States in the fall of 1897 was powerfully stimulated as a result of the higher prices for American farm products caused by foreign failures. It is possible that the historical parallelism to the recovery after 1873, which many saw, and the devastating effect of returning agricultural prosperity on the agrarian argument for free silver, which many hoped for, may have placed a greater emphasis on higher agricultural prices than was actually merited. It is also probable that the new agricultural prosperity was merely a powerful accelerating force to a recovery which might have evolved at a slower pace without any such accidental impetus. That it was a powerful impelling force to national recovery at the time it actually occurred, seems, however, unquestionable.

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³⁴ Kansas City *Star*, Sept. 2, 1897, p. 7; Oct. 24, p. 8; N. Y. *Herald*, Oct. 25, 1897, p. 13; *Orange Judd Farmer*, 24:10 (Jan. 1, 1898).

THE TRANSITION FROM SLAVE TO FREE AGRICULTURAL LABOR IN THE SOUTHERN STATES

OSCAR ZEICHNER

The tradition of the free independent farmer in the North and West and the presence of slavery in the South until 1865 have exercised an important influence on the history of agricultural labor in the United States. Insofar as the idea prevailed that the owner of a farm cultivated it himself, there was little or no realization of the existence of tenure groups below that of the freehold. However, when economic changes reduced an increasing number of farm owners to the status of tenant or farm laborer, many persons realized for the first time what was happening to a mounting percentage of the Nation's agrarian citizenry in all parts of the country. Today, one of the most baffling problems confronting economists, social reformers, and practical politicians is the growing class of agricultural laborers and farm tenants.

This problem, however, is not new to the South. The features of the agricultural labor system are essentially the same today as they were when they first appeared seventy-five years ago. Current developments, such as the declining cotton economy and the possible introduction of cotton-picking machinery on a wide scale, have somewhat affected these features, but as yet the changes produced by them have been comparatively unimportant. Since the present-day agricultural labor systems of the South have their roots in the years immediately following the conclusion of the Civil War, a study of those years should make clear how and why these systems came to be what they are.

After the end of the war, planting operations in the South were in a state of adjustment and even confusion. Before 1865, Southern agriculture, especially cotton growing, had been based on the labor of Negro slaves. On the large units this labor was organized and directed by the plantation owners or, more frequently, by overseers, and on the small farms the slaves worked under the direct supervision of their masters. During the war, the labor system was severely disrupted. Large numbers of slaves left their homes and followed the invading armies; many fled to Northern camps for refuge, while others enlisted in the Union Army. Settlements supervised by Army officers and Treasury agents were set up on the banks of the Mississippi and along the seaboard, and the Federal Government fed the Negro refugees who were not able to work in the "contraband" camps.¹ The majority of the slaves, however, remained on the plantations, especially in those parts of the South which had not been directly touched by the war. Although most of them were faithful to their masters and

¹ Carl Schurz, "Report on the Condition of the States of South Carolina, Georgia, Alabama, Mississippi, and Louisiana," 39 Congress, 1 Session, *Senate Executive Document 2*, p. 15 (serial 1237). Hereafter cited as Schurz, *Report*. See also J. P. McConnell, *Negroes and Their Treatment in Virginia from 1865 to 1867*, p. 10-11, 17 (Pulaski, Va., 1910).

waited quietly for the final outcome, not all were ignorant of the significance of the conflict. "From the first they realized that this contest was in a large measure concerning themselves. . . . Later they heard that the invading hosts of the North were coming to greet them as 'men and brothers'."²

One of the messages brought by the "invading hosts" was that of a future redistribution of the plantations. The Yankee soldiers spread the idea that the landholdings of those who fought against the North would be confiscated and given to the former slaves and to those who had been faithful to the Union. The troops of Sherman's army, for example, told the Negroes along the line of march of future land confiscation and division.³

Although Southerners charged that the rumors of coming land changes were the result of Northern propaganda, many slaves had actually been introduced to the idea without Northern interference. The planters themselves generally expected that their land would be confiscated. In Texas "Public speakers in different portions of the State declared and insisted . . . that if the southern people were beaten, all the lands and property would be taken from them and given to the blacks."⁴ Designed to inspire the South to carry on its struggle more vigorously, this argument also helped spread the belief that in the future, land would be distributed among the Negroes. The legislators of the Southern States and the Confederate Congress repeatedly mentioned the matter of confiscation in their public addresses. The Confederate Congress in its last declaration in March 1865 warned the South "that the penalty for failure would probably be confiscation of estates, which would be given to their former bondsmen."⁵

Most important, however, in creating and strengthening the rumors of changes were the various acts of confiscation. Although they were not extreme in nature, and the total number of Negroes who benefited under their provisions was small, they aroused in the freedmen the hope of future land divisions.⁶ The "acts of forfeiture" of 1862 put into the hands of the Federal Government all the lands of St. Helena Parish and thousands of acres on Port Royal Island, South Carolina; these lands were then sold on long terms to Negroes and liens taken as security.⁷ Under an act of March 3, 1863, military officers turned over to the Treasury all captured and abandoned property. Some plantations were disposed of at tax sales, and a few subdivisions of the larger ones were purchased

² McConnell, *Negroes and Their Treatment in Virginia*, 17; Whitelaw Reid, *After the War: A Southern Tour*, 301 (Cincinnati, 1866).

³ "Report of the Joint Committee on Reconstruction," 39 Congress, 1 Session, *House Report 30*, pt. 2, p. 227 (Washington, 1866—serial 1273), hereafter cited as *RJCR*; Speech of General O. O. Howard at Cooper Institute, cited in *De Bow's Review*, 1:324 (March 1866); Reid, *After the War*, 335-336; Charles Nordhoff, *The Cotton States in the Spring and Summer of 1875*, p. 107 (New York, 1876).

⁴ *RJCR*, pt. 2, p. 221; pt. 4, p. 37.

⁵ W. L. Fleming, "Forty Acres and a Mule," *North American Review*, 182:723 (May 1906).

⁶ J. G. Randall, *The Confiscation of Property during the Civil War* (Indianapolis, 1913); Fleming, "Forty Acres and a Mule," 723-726.

⁷ Edward King, *The Great South*, 427 (Hartford, 1875).

by Negroes. The chief beneficiaries of this act, however, were Northerners who hired Negroes to cultivate the land.⁸ By an act of July 2, 1864, Treasury agents were authorized to seize and lease for one year all captured and abandoned estates and to see that the former slaves were cared for. Plots of land, called freedmen's labor colonies, were designated for the exclusive use of ex-slaves.⁹ Under the Freedmen's Bureau Act of March 3, 1865, land which had been abandoned or acquired by confiscation, sale, or otherwise, could be set apart for the use of loyal freedmen and refugees. The latter were allowed to purchase not more than 40 acres for each person during or at the end of three years.¹⁰

Many Northerners supported this policy, and some urged the adoption of drastic confiscation measures. Thaddeus Stevens demanded more extreme legislation with two objects in mind—to extinguish the national debt incurred during the war, and to establish a landed peasantry in the South.¹¹ He was not alone in advancing this proposal. Wendell Phillips, Charles Sumner, and the American Anti-Slavery Society favored it; G. W. Curtis endorsed it, and the *Nation* might have supported it in 1865;¹² but the North was not ready to carry out this program, and in the meantime presidential reconstruction got under way.

In 1864 Andrew Johnson had been in favor of seizing and dividing the Southern plantations, but his attitude soon changed, and by late 1865 it was clear that the confiscation laws would not be carried out.¹³ General Sherman's order of January 16, 1865, which reserved the islands south of Charleston, the abandoned fields along the rivers for 30 miles back from the sea, and the country bordering the St. Johns River in Florida, for the freedmen, was rescinded by the President in October 1865, and the lands which had been seized under that order were required to be returned to their former owners.¹⁴

These events both disappointed and antagonized the Negro laborers who, as one observer reported, could not see "what good it did them to make them free, unless they were to have the land to which their slave labor had given all their value."¹⁵ Division and allotment of land by the Freedmen's Bureau was made useless, while many of the freedmen were dispossessed and left homeless. "The superintendent of schools under the Freedmen's Bureau estimated the entire number of persons thus rendered homeless in eastern Virginia at the beginning of the winter [of 1865-66] to be not less than seventy thousand."¹⁶ In some cases evictions were carried out in a summary fashion that further embittered

⁸ P. S. Peirce, *The Freedmen's Bureau: A Chapter in the History of Reconstruction*, 22 (Iowa City, 1904).

⁹ *Ibid.*, 24. "Property, real and personal, was declared abandoned when the lawful owner was absent aiding the rebellion."

¹⁰ *Ibid.*, 45.

¹¹ Speech by Stevens at Lancaster, Pa., on Sept. 7, 1865.

¹² *Harper's Weekly*, 11:306-307 (May 18, 1867); *Nation*, 4:375 (May 9, 1867).

¹³ W. E. B. Du Bois, *Black Reconstruction . . . 1860-1880*, p. 245 (New York, 1935); Fleming, "Forty Acres and a Mule," 722-723; Reid, *After the War*, 323.

¹⁴ Sidney Andrews, *The South since the War*, 208-211 (Boston, 1866).

¹⁵ Reid, *After the War*, 147.

¹⁶ *Ibid.*, 325-326. See also Peirce, *Freedmen's Bureau*, 131.

the relationship between planter and laborer.¹⁷ A Northern writer who was reporting on conditions in the South immediately after the war noted that the freedmen "say that they will not under any circumstance work with overseers as heretofore, which is what the planters propose. Some few of them seemed willing to work for fair wages, but the great body were anxious to rent or buy lands, to which the planters will not consent."¹⁸

The hope of the Negroes that they would receive farms had serious effects upon the labor situation. Freedmen expecting land hesitated to return to the plantation system of farming, either on a wage basis or on shares, and as a result, many refused to make contracts for the resumption of activities on the plantations. A planter in South Carolina complained that the belief in land division among the former slaves "produced discontent, impatience, and insubordination, irritation on both sides"; another in the same State attributed the vagrancy of the freedmen to his expectation of "getting his share of the lands."¹⁹ General Grant wrote in December 1865 that the Negroes' belief that the land of the planters would "be divided among them. . . is seriously interfering with the willingness of the freedmen to make contracts for the coming year. . . . The effect of the belief in division of lands is idleness and accumulation in camps, towns, and cities."²⁰ Those laborers who had gone back to work were made "uneasy and unreliable as plantation hands."²¹

The attitude of some of the planters toward the new state of affairs further complicated the already chaotic labor situation. Many were naturally embittered at the sudden loss of their wealth, caused by the emancipation of their slaves and the devastation wrought by the armies. This feeling was accentuated by the fact that the final change in the labor system had occurred in the midst of the crop season.²² Although the planters who treated their hands fairly were able to secure laborers, this policy was not always adhered to.²³ Many cotton growers felt that if they could not control their labor in the customary manner it would be best to turn the Negroes off the plantations and import white or coolie labor. "We can drive the niggers out and import coolies that will work better, at less expense, and relieve us from this cursed nigger impudence," was a not uncommon attitude in Mississippi, Tennessee, Georgia, Alabama, and Louisiana.²⁴ The effort to stimulate immigration into the South was

¹⁷ Fleming, "Forty Acres and a Mule," 728.

¹⁸ Andrews, *South since the War*, 212. Planters were noted to be "resolved never to give up their farms" to the freedmen.—*De Bow's Review*, 2:56 (July 1866).

¹⁹ *De Bow's Review*, 1:440-441, 552 (April 1866); 3:490 (May 1867); 4:234, 336 (September, October 1867).

²⁰ J. T. Trowbridge, *The South*, 362 (Hartford, 1866). Cf. Andrews, *South since the War*, 97-98; Letter of U. S. Grant to President Johnson, Dec. 18, 1865, accompanying Schurz, *Report*, 106-108.

²¹ Andrews, *South since the War*, 24-25.

²² Schurz, *Report*, 16; McConnell, *Negroes and Their Treatment in Virginia*, 30-31.

²³ *RJCR*, pt. 2, p. 32, 154; pt. 3, p. 6, 25, 65-66; pt. 4, p. 38, 66, 69.

²⁴ Reid, *After the War*, 417-418. See also Andrews, *South since the War*, 363; *RJCR*, pt. 2, p. 34, 48, 57, 128; Address of the Equal Rights Convention of Georgia to the Legis-

not very successful, and by the end of 1866 and 1867, it was already obvious to some that their "sole reliance hereafter, as heretofore, for farm hands must be on the negroes."²⁵

The high price of cotton was a powerful stimulus to the resumption of planting operations.²⁶ The chief difficulty arose in connection with the labor supply which was insufficient to meet the needs of the planters. Several methods were adopted, therefore, to stabilize and enlarge the labor force, but the efforts were nullified, to some extent, by the very means that were employed. In certain instances planters filled their quota of hands by paying the fines of Negroes on chain gangs or by bailing out those in jail and making them work off the fee.²⁷ In isolated communities, cases occurred where planters succeeded in forcing their laborers to remain on the plantations for a limited period. Not infrequently patrols were organized to regulate labor conditions and to prevent the former slaves from leaving. "In many instances negroes who walked away from the plantations, or were found upon the roads, were shot or otherwise severely punished."²⁸

Because of these conditions, the freedmen were generally difficult to manage and were hesitant about making contracts with their former masters. Nevertheless, many Negroes soon realized the meaning of those "plain principles of political economy" which required them to "work or starve," and thousands of contracts were concluded in 1865 and 1866.²⁹ Moreover, the labor legislation of the State governments set up under presidential reconstruction, and the widespread refusal of the planters to allow Negroes to acquire property or become leaseholders forced them to make agreements either as wage hands or as workers for a part of the crop.³⁰ Officers of the Freedmen's Bureau often persuaded the former slaves to sign contracts, and tried to dispel their notions concerning land confiscation.³¹

The efforts to make the Negro laborers return to work were not always successful. Most of the freedmen had no conception of the nature of contracts and

lature of Georgia, Jan. 10, 1866, quoted in *American Freedman*, 1:13 (April 1866); McConnell, *Negroes and Their Treatment in Virginia*, 16, 45-46. Many planters doubted that the freedmen would "work and cultivate the soil without coercion."—*De Bow's Review*, 1:22-23, 73-74, 184, 224, 324 (January, February, March 1866); 2:75 (July 1866); 3:356 (April-May 1867).

²⁵ *De Bow's Review*, 1:8, 87-94, 224 (January, February 1866); 2:215-217, 490 (August, November 1866); McConnell, *Negroes and Their Treatment in Virginia*, 33.

²⁶ According to King, *Great South*, appendix, p. 4, the average price of cotton per pound as quoted in New York was as follows: 1863-64, -101.5; 1864-65, -83.38; 1865-66, -43.20.

²⁷ Trowbridge, *The South*, 448.

²⁸ Schurz, *Report*, 17-19; Andrews, *South since the War*, 219-220.

²⁹ *De Bow's Review*, 1:72-73, 283 (January, March 1866).

³⁰ R. P. Brooks, *The Agrarian Revolution in Georgia, 1865-1912*, p. 13-14 (Madison, 1914); Report of Colonel Samuel Thomas, quoted in Schurz, *Report*, 82; Andrews, *South since the War*, 206; *De Bow's Review*, 2:639-640 (December 1866); McConnell, *Negroes and Their Treatment in Virginia*, 35-36, 57.

³¹ *RJCR*, pt. 2, p. 227; pt. 3, p. 160. Letter from Major-General Howard to the N. Y. *Evening Post*, quoted in *American Freedman*, 1:90 (September 1866).

many, freed from the compulsion that had been exercised over them during slavery, left the plantations merely to enjoy their freedom. Some fled to the towns and cities, fearing that the contracts would bring them into slavery again, while others left to escape the violence that was being used to compel them to contract.³²

The practice of breaking contracts, however, was not a fault peculiar to the freedmen. The confused and troubled labor situation in 1866 and 1867 was due to some extent to the failure of the planters to keep the promises they had made to their plantation hands. The feverish haste to raise a cotton crop in 1865 and the scarcity of available capital frequently led the planters to overreach their means, and, as a result, labor conditions were very poor and aroused dissatisfaction and discontent. Not only were food rations often of the cheapest sort, but they were also rather scanty.³³ Plantation discipline was especially harsh. In some cases the methods of punishment that had been used during slavery were applied to the freedmen in an attempt to secure a subdued and steady labor force.³⁴

The failure of the planter to pay his hands adequate wages, or any wages at all, also made the laborer more restless and unwilling to remain on the plantation. Brigadier General W. E. Strong wrote from Texas that he was not at all surprised that freedmen were refusing to sign labor contracts for the year 1866. He attributed their refusal to the fact that "They have universally been treated with bad faith, and very few have received any compensation for work performed up to the close of the year 1865."³⁵ The *Nashville Press and Times* thought that Southern planters had an excellent opportunity to realize large profits from the 1866 crop, if they could secure "the confidence of the laborers, who . . . are justly entitled to the prompt payment of fair wages." The latter consideration was "the turning point of the whole matter."³⁶ From Georgia it was reported that many planters had let their employees go with little or no money.³⁷ The North Carolina Freedmen's Convention complained that some planters "have withheld a just compensation or have awarded such pay as would not support the laborer and his family. Others have driven their hands away without any pay at all."³⁸

Where the former slave had agreed to work for a share of the crop, other difficulties developed, especially over the distribution of shares. Although in a large number of cases they were fairly divided between planter and laborer, frequently the share given to the latter was so small that at the end of the crop

³² *RJCR*, pt. 3, p. 6, 142-143; F. B. Leigh, *Ten Years on a Georgia Plantation*, 83-84 (London, 1883); Andrews, *South since the War*, 349-353; McConnell, *Negroes and Their Treatment in Virginia*, 55-56; Reid, *After the War*, 455.

³³ Andrews, *South since the War*, 203-205; Reid, *After the War*, 290-291.

³⁴ Andrews, *South since the War*, 203; Report of the Georgia Equal Rights Association Convention, quoted in *American Freedman*, 1:87 (September 1866).

³⁵ Letter of W. E. Strong to General O. O. Howard, in *RJCR*, pt. 4, p. 38.

³⁶ Quoted in *De Bow's Review*, 1:199 (February 1866).

³⁷ Andrews, *South since the War*, 368-369.

³⁸ Quoted in *ibid.*, 129.

season he received little or nothing for his year's labor.³⁹ Occasionally the laborer was driven from the plantation without receiving his promised share of the crop. In the Barnwell district of South Carolina, "On some of the plantations the freedmen do not get a share of all the produce, the planters withholding the cotton crop on some plea best known to themselves." In another part of the same State, eighty-one of the freedmen who had raised a large crop during 1865 were dismissed by a planter who told them that "they had no share in the crop."⁴⁰ Around Vicksburg, Mississippi, it was reported that "the negroes . . . have been shamefully abused. They had been promised that if they would remain and work the plantations, they should have a share of the crops; and now the planters refuse to give them anything."⁴¹

In many cases the laborer was not entitled to receive compensation. This situation was the result of the peculiar economic conditions which arose at the end of the war. The Negro, although possessing his legal freedom, was still dependent on his employer for food, clothing, and other necessities. Before emancipation the planter had issued these supplies free; afterward he either set up his own store on the plantation and charged his hands for the goods they purchased, or asked some merchant to supply the provisions on his, the planter's, credit.⁴² In either case the laborer was charged for the supplies he received, and at the end of the year their cost was deducted from the value of his share of the crop. Frequently the net sum was very small, and sometimes the freedman was considered fortunate if he was able to complete the year's labor without being in debt. An officer of the Freedmen's Bureau found the following conditions among the former slaves on one plantation in December 1866: "At the settlement it was found that some had overdrawn their accounts, some came out about even, some had five dollars due them, and one or two had as high as thirty dollars coming to them for their year's labor." General O. O. Howard told of an incident involving freedmen in Lynchburg, Florida, who "had raised 1,000 bushels of wheat, of which they were entitled to half, but the master had taken it all to pay expenses. They were greatly depressed too, because the master said they would be \$2,400 in debt at the end of the year."⁴³ Moreover, in such a situation it was easy for unscrupulous planters to take advantage of the laborers. A contemporary observer found that "the better class of planters admitted that the system was liable to gross abuse." One of these planters declared in conversation that he had seen neighbors "who keep stores of plain goods and fancy articles for their people; and, let a nigger work ever so hard, and earn ever so high

³⁹ Schurz, *Report*, 29.

⁴⁰ Although this practice was not universal it was reported not to be uncommon. *RJCR*, pt. 2, p. 52, 222; pt. 4, p. 88. In Mississippi an army captain testified that "in ninety-nine cases out of a hundred the freedmen were driven off without payment."—*Ibid.*, pt. 3, p. 142. For the same in Georgia, see Andrews, *South since the War*, 322–323.

⁴¹ Trowbridge, *The South*, 363.

⁴² For an example of the former, see *RJCR*, pt. 4, p. 143–144.

⁴³ *De Bow's Review*, 1:325 (March 1866); 3:562 (June 1867).

wages, he is sure to come out in debt at the end of the year."⁴⁴ Another planter described a typical situation at settlement time in the following manner: "After the cotton is sent to market, the proprietor calls up his negroes, and tells them he has furnished them such and such things, for which he has charged so much, and that there are no profits to divide. The darky don't understand it,—he has kept no accounts; but he knows he has worked hard and got nothing."⁴⁵

In spite of these unfavorable conditions, the cultivation of cotton went on. In general, during the first few years after 1865, wage labor prevailed on the plantations. The amount received by the laborers varied according to individual contracts, the region of the country, its fertility, and other factors. In 1865 wages in the old cotton country ranged from \$2 to \$18 per month with board,⁴⁶ but they were somewhat higher in the West. In 1867, North Carolina paid an average of \$104 per year; South Carolina, \$100; Georgia, \$125; and Alabama, \$117. However, the younger cotton States were again able to offer better wages in the competition for labor, Mississippi averaging \$149 per year; Texas, \$139; Louisiana, \$150; and Arkansas, \$158. There was a great decrease in wages in 1868, North Carolina averaging \$89; South Carolina, \$93; Georgia, \$83; and Alabama, \$87. The West also paid less, although the averages were higher than in the East, the figures being as follows: Mississippi, \$90; Louisiana, \$104; Arkansas, \$115; and Texas, \$130.⁴⁷

The wage system, in general, proved to be unsuccessful. One of the reasons for its failure was the fact that cotton production was not uniformly profitable throughout the South. Large numbers of freedmen moved from Georgia, Alabama, and other southeastern States to Arkansas, Louisiana, and Mississippi where wages were higher.⁴⁸ "It was estimated in the spring of 1874 that Alabama had already lost from \$700,000 to \$1,000,000 in her labor element alone. . . . In 1873 Georgia lost fully 20,000 of her able-bodied colored laborers."⁴⁹ The planters who were unable to meet the competition for labor did not look with favor on the wage system which was depleting their already scarce and too mobile labor force.

The general lack of capital also contributed to the gradual abandonment of the wage system. As there were no banks left solvent after the war, the planters found it very difficult to pay money wages. This condition was accentuated

⁴⁴ Trowbridge, *The South*, 366, 392, 409.

⁴⁵ *Ibid.*, 363.

⁴⁶ *RJCR*, pt. 3, p. 58, 72, 99; pt. 4, p. 70, 116; V. V. Clayton, *White and Black under the Old Regime*, 155 (Milwaukee, 1899); *De Bow's Review*, 1:439, 658 (April, June 1866); 5:213 (February 1868).

⁴⁷ The original source for these figures does not state whether they were in greenbacks or in specie, but wages were probably paid in the former. These prices included rations without clothing. "The rations were chiefly bacon and meal, 3½ pounds of the former and a peck of the latter."—U. S. Commissioner of Agriculture, *Report*, 1867, p. 416.

⁴⁸ Brooks, *Agrarian Revolution in Georgia*, 15-17.

⁴⁹ King, *Great South*, 300.

by the fact that 1866 and 1867 were disastrous years for cotton growing.⁵⁰ Perhaps the most important reason, however, for the failure of the wage system was its inability to give the planter adequate control of his labor. Large-scale units in agriculture, of which the plantation is an example, demand a steady and stable labor supply or an advanced technology.⁵¹ Whereas slavery had assured a permanent and reliable labor force, wage labor was too mobile, and the planter was not certain that his hold on the laborers "was secure enough to give him the slightest guaranty of being able to gather what he was planting."⁵² In the 1867 report of the United States Commissioner of Agriculture, it was stated that the wage system had "generally proved unprofitable, the freedmen being inclined to use too freely their newly-found liberty."⁵³ When the Governor of Mississippi declared that "the employer must be assured that the labor contracted for will be specifically performed," he expressed the viewpoint of all planters who were harassed by labor troubles. It was impossible for the planter to farm "unless the laborer is compelled to comply with his contract,—remaining and performing his proper amount of labor, day after day, and week after week through the whole year."⁵⁴

To achieve this result the share system was adopted, and sharecropping became the common form of labor on the plantation. Unfortunately the historical, economic, and legal differences between the share tenant and sharecropper have generally been ignored, with the result that the two categories have been confused. The cropper is a farm worker, usually under the close supervision of the planter, who generally has no title to the crops he raises, yet supplies all the labor and usually half of the seed which he gets on credit, and receives as wages half of the crop or its proceeds. The planter furnishes the land, workstock, and farming implements. The share tenant in some States is considered a tenant, and therefore has title to the crop of which he keeps three-fourths if it is cotton, and generally supplies everything except the land. Most of the freedmen became croppers. An example of the significance of the difference between the two classes may be seen in the fact that many of the important provisions of the AAA contracts were based upon the realization that the share-crop status and share-rent status were not the same.

As early as 1864 planters in the Vicksburg region recommended that part of

⁵⁰ *RJCR*, pt. 2, p. 5, 124, 130, 182; *American Freedman*, July–August 1868, p. 446; *De Bow's Review*, 1:332 (March 1866); Schurz, *Report*, 29.

⁵¹ L. C. Gray, "Southern Agriculture, Plantation System, and the Negro Problem," *American Academy of Political and Social Science, Annals*, 40:92 (March 1912).

⁵² Reid, *After the War*, 569. This was also the view of Confederate General E. C. Cahell. *De Bow's Review*, 1:657 (June 1866).

⁵³ U. S. Commissioner of Agriculture, *Report*, 1867, p. 416.

⁵⁴ Message of Governor B. G. Humphreys to the Mississippi Legislature, October 1865, quoted in A. H. Stone, "Mississippi's Constitution and Statutes in Reference to Freedmen, and Their Alleged Relation to the Reconstruction Acts and War Amendments," *Mississippi Historical Society, Publications*, 4:162 (Oxford, Miss., 1901); *De Bow's Review*, 1:328 (March 1866).

the wages, whether in money or produce, be retained by the employer in order to keep the laborers from "running around."⁵⁵ In the same year, cotton growers in Louisiana were advised "to discourage monthly payments so far as it can be done without discontent, and to reserve till the full harvest the yearly wages."⁵⁶ Typical of the views of many planters was the suggestion that labor be stabilized and controlled by providing that "payments beyond proper and prescribed supplies to be small, the smaller the better, and still better if withheld till the crop is made and saved."⁵⁷ In some instances planters immediately adopted the sharecrop system.⁵⁸ This method was not uncommon in South Carolina, Mississippi, and Louisiana during 1865 and 1866, and one reporter wrote from South Carolina that "the compensation . . . in nearly all instances . . . is a part of the crop."⁵⁹ By 1867 sharecropping had been "generally adopted" in Mississippi, and the following year the Freedmen's Bureau in Georgia indicated that the majority of labor contracts for 1868 were for a share of the crop.⁶⁰

The transition from wage labor to sharecropping was gradual, taking place over a period of years. Contracts varied, therefore, in many features with regard to the respective shares of the laborer and the planter, and the duties of each in the planting operations. One Georgia planter, for example, who had paid his hands wages in 1866, selected the best workers and their families, measured off a portion of land for each family or squad, and gave a mule to each two workers the following year. The laborers received half of the corn and a

⁵⁵ U. S. Army, Department of the Tennessee and State of Arkansas, General Superintendent of Freedmen, *Report*, 1864, p. 31 (Memphis, Tenn., 1865).

⁵⁶ *De Bow's Review*, 1:438 (April 1866); 2:211 (August 1866).

⁵⁷ Schurz, *Report*, 86. "From the landlord's point of view, the use of cropper rather than wage labor may be a means of stabilizing the labor supply."—C. O. Brannen, "Relation of Land Tenure to Plantation Organization," U. S. Department of Agriculture, *Department Bulletin* 1269, p. 32 (Washington, 1924). With respect to Georgia, Brooks, *Agrarian Revolution in Georgia*, 66, noted: "The wage hand was an uncertain factor in that he was liable to disappear on any pay day; the cropper is obliged to stay at least during an entire year, or forfeit his profits." On Edisto Island, South Carolina, some features characteristic of serf labor were reproduced to ensure a steady labor supply. "The laborer gives the landlord two days' work in every week during ten months of the year, and receives in return a house, fuel, and 6 acres of arable land, which, together with such other land as he may rent, he cultivates on his own account during the remainder of the week. When extra work is required on the farm, these laboring tenants are employed at 50 cents per day. The system is reported as being quite unsatisfactory, these two-day hands not cultivating more than two acres as an average for the proprietor, and burdening his estate with the support of a much larger population than necessary to its cultivation. By means of this, however, a large amount of resident labor is secured on the place, which is of prime importance during the cotton-picking season."—U. S. Census, Tenth Census, 1880, *Report on Cotton Production in the United States*, 6(2):61.

⁵⁸ Andrews, *South since the War*, 322; *De Bow's Review*, 1:224, 326-328, 658 (February, March, June 1866); McConnell, *Negroes and Their Treatment in Virginia*, 30-31.

⁵⁹ Reid, *After the War*, 84; *RJCR*, pt. 3, p. 134; pt. 4, p. 135.

⁶⁰ *De Bow's Review*, 4:106 (July-August 1867). This statement was questioned by Brooks, *Agrarian Revolution in Georgia*, 47.

third of the cotton, and furnished themselves, that is, supplied their own food and clothing, while the planter provided the land, workstock, feed, and implements.⁶¹ An Arkansas planter remarked, "I furnish everything but clothes, and give my freedmen one third of the crop they make. On twenty plantations around me, there are ten different styles of contracts."⁶² In North Carolina, the laborer's share varied from one-fourth to one-third, while in Louisiana some freedmen worked for one-sixth to one-tenth of the crop and their support. One Louisiana planter who managed 5,000 acres gave his hands one-seventh of the crop.⁶³ Although at first it was roughly estimated that one-third of the crop was attributable each to land, labor, and equipment, the complaint of the cropper that his share was not enough, and the stabilization of the system resulted in the general practice of both the cropper and the planter receiving one-half of the crop.⁶⁴

Thus, out of the confused post-war conditions, there arose the systems of land tenure and labor organization which now characterize the rural South. Today, attempted reforms plan a more equal distribution of the land and a decrease in the number of tenants and sharecroppers. These problems might have been obviated by the adoption of an intelligent and non-vindictive economic program seventy years ago. Such was not the case, however, and the freedmen, discontented, sometimes ill-treated and poorly paid, and expecting a land division that never came, returned to the plantations. At first, wage labor was the most important system used, but, chiefly because it was unable to insure a steady and reliable labor force, it was gradually superseded by sharecropping and renting.⁶⁵

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⁶¹ U. S. Commissioner of Agriculture, *Report*, 1867, p. 419.

⁶² Trowbridge, *The South*, 391.

⁶³ Andrews, *South since the War*, 189; *RJCR*, pt. 4, p. 116; Trowbridge, *The South*, 392. For types of contracts, see *De Bow's Review*, 1:326-328, 658 (March, June 1866); 5:213 (February 1868).

⁶⁴ Holland Thompson, "The Civil War and Social and Economic Changes," *American Academy of Political and Social Science, Annals*, 153:14-15 (January 1931); R. H. Woody, "The Labor and Immigration Problem of South Carolina during Reconstruction," *Mississippi Valley Historical Review*, 18:199-200 (September 1931). See also McConnell, *Negroes and Their Treatment in Virginia*, 30-31.

⁶⁵ The labor problem was not completely solved by 1868, but late in that year, it was noted that "Labor on the plantations has become more systematized."—*De Bow's Review*, 5:973, 974, 977 (October 1868). For a good contemporary summary on post-war agricultural labor, see the report of B. F. Nourse, U. S. Commissioner to the Paris Exposition in 1867, in *De Bow's Review*, 6-7:791 (September 1869).

PETER KALM'S SHORT ACCOUNT OF THE NATURAL POSITION,
USE, AND CARE OF SOME PLANTS, OF WHICH THE SEEDS WERE
RECENTLY BROUGHT HOME FROM NORTH AMERICA FOR
THE SERVICE OF THOSE WHO TAKE PLEASURE IN EXPERI-
MENTING WITH THE CULTIVATION OF THE SAME IN OUR
CLIMATE

ESTHER LOUISE LARSEN, *translator*

Among the most important sources of historical information on mid-eighteenth century America are the writings of Peter Kalm, the famous Swedish botanist. Historical students are generally familiar with Kalm's famous journal, *En Resa til Norra America* (Stockholm, 1753-1761), which has been translated and variously published in Dutch, English, French, and German, but his articles on American subjects which appeared in the Kongl. Svenska Vetenskaps Academiens *Handlingar* for 1749 to 1778 are also important, especially for the scientific observations which they contain, and deserve translation and scholarly attention.¹

Shortly after his return to Sweden, Kalm issued a small octavo pamphlet of forty-eight pages which has no title page but bears the colophon "Stockholm, uplagdt på Lars Salvii kostnad [issued at Lars Salvius' expense], 1751."² This publication carries the heading, "En Kårt Berättelse, om Naturliga stället,

¹ For biographical information on Peter Kalm, see *Agricultural History*, 9:98-101 (April 1935); and A. B. Benson, ed., *The America of 1750; Peter Kalm's Travels in North America*, 1:vii-xviii (New York, 1937). The latter work contains "A Bibliography of Peter Kalm's Writings on America," 2:770-776, which originally appeared in *Scandinavian Studies and Notes*, May 1933, p. 89-98. This list, however, does not mention Esther Louise Larsen's translation of Kalm's "Beskrifning om Mays, Huru den planteras och skötes i Norra America, samt om denna Sädes-artens mångfaldiga nytta" in the Kongl. Svenska Vetenskaps Academiens, *Handlingar*, 12:305-318 (1751); 13:24-43 (1752), which appeared with the title, "Pehr Kalm's Description of Maize, How It Is Planted and Cultivated in North America, together with the Many Uses of This Crop Plant," in *Agricultural History*, 9:98-117 (April 1935).

² This pamphlet is described by B. Daydon Jackson, the English botanist, in the *Journal of Botany*, 60:334-335 (November 1922). His bibliographical note reads in part as follows: "the copy before me is of the same size and bound up with sundry copies of the *Lärda Tidningar*, the well-known Swedish scientific journal of the 18th century, of which it is probably a supplement. . . . I have failed to find another copy, in the British Museum at Bloomsbury or Cromwell Road, or at Kew. Pritzel does not mention it, nor is it catalogued in the last Library Catalogue of the Linnean Society, 1896. It came to light in preparing the new edition for printing in the near future, amongst the Linnean volumes, bound amongst some numbers of the *Lärda Tidningar*, 1745-52."

This pamphlet is also mentioned in the initial paragraph of H. O. Juel and J. W. Harshberger, "New Light on the Collection of North America Plants Made by Peter Kalm," Academy of Natural Sciences of Philadelphia, *Proceedings* (1929), 81:297-303, but it is not included in the Kalm bibliography by A. B. Benson which is cited in footnote 1.

nyttan, samt skötseln af några växter, utaf hwilka frön nyligen blifwit hembragte från Norra America, til deras tjenst, som hafwa nöje, at i vårt Climat göra försök med de sammans cultiverande [A short account of the natural position, use, and care of some plants, of which the seeds were recently brought home from North America for the service of those who take pleasure in experimenting with the cultivation of the same in our climate]" at the top of the first page, and immediately following is the notation, "På Kongl. Wetenskaps *Academiens* befallning upsatt [Printed at the command of the Royal Academy of Science]." It constitutes a comprehensive summary of Kalm's observations on the habitat, use, and care of American plants which he considered of sufficient economic importance to warrant experimental introduction into Sweden.

The translator is grateful to Frederick E. Brasch of the Smithsonian division of the Library of Congress for securing a photostatic copy of this rare pamphlet from the Royal Library at Stockholm, and the text is here translated into English for the first time. The footnotes are by the translator.

[Text]

By the authority of the members of the Royal Academy of Science, I have chosen this means to give an index and short account of some of the useful plants, the seeds of which I brought home with me from North America where I made a journey at the command of the Royal Academy of Science.

I have found it necessary to discuss briefly the places where these plants occur and thrive in nature, with this in mind—those who wish to try a hand at cultivating these plants must have some definite basis on which to build and must know what soil to try in order to follow nature.

In order to avoid prolixity, I have only mentioned the uses of these plants in one or two words. In the future, when, God willing, I publish the journal of my travels, all details will be amply discussed.

There are only a few of these plants which I have had the pleasure of trying my hand at planting. I have of necessity been traveling to and fro in order to collect seeds. Because of the lack of my own experience in the care of these plants, I have observed diligently the ways followed by nature herself. In the meantime, in order that those of my countrymen who do not have access to good books on gardening but wish to experiment with the cultivation of these plants may have something to guide them in addition to my own observations and experiments, I have drawn the most essential information given on the planting and care of some of the plants mentioned from that excellent work on English gardening, Mr. Philip Miller's *Gardeners Dictionary*.³ Mr. Miller has to his credit nearly forty years of successful gardening, and his book has won general praise both in England and elsewhere abroad. It is a jewel and a masterpiece which has scarcely an equal in the theory and practice of the science of gardening and horticulture. If one has this book one can, without particular difficulty, do without all others. I only

³ Philip Miller, *The Gardeners Dictionary; Containing the Methods of Cultivating and Improving the Kitchen, Fruit and Flower Garden; as also, the Physick Garden, Wilderness, Conservatory, and Vineyard* . . . adorn'd with copper plates (London, 1731). In the present translation as well as in the original Swedish text, the botanical abbreviation, "Mill.," refers to this work. Kalm also used "Miller" occasionally.

regret that we do not have as yet a translation of either the whole book or at least its essential parts in our own language, although it has already been translated into both the French and German. I have the seeds of all the plants mentioned in this article. I also have seeds of some hundred different types of plants, for which I have been unable to find any use, and a long list which the savages (whom the Swedes living in America call *Willa Americaner*, and whom the French call *les sauvages*) use in medicine. Presenting these seeds to the garden of the Academy will be sufficient for the present.

In the meantime, since it is already near the end of the season, I wish that those who have already taken and those who hereafter take the seeds of these plants which will be listed immediately may not sow all the seeds at once but save some of them to plant in the autumn and some next spring.

Not until I see at least the most useful of these plants thriving in my native land and giving benefits to all will I consider myself fortunate and my journey to America worth while, for *nisi utile est quod facimus stulta est gloria* has always been my motto.

1. *Abies, piceae foliis, brevibus conis minimis.*⁴ Mill. Sp. 5. It grows in the northern part of America in the same type of place as our spruce and is called *epinette blanche* by the French. *Use*: From its branches and needles a healthful and agreeable small beer is made in both Canada and the English Colonies. However, I believe an equally good drink could be brewed from our Swedish spruce. *Care*: It is sown and handled in the same way as our Swedish spruce.

2. *Abies cortice laevissimo, vesiculis resina limpidissima repletis, instructo.*⁵ Mill. Sp. 7. This is called Balm-of-Gilead fir. It grows in the forests of Canada as well as in the so-called Blue Mountains in the English Colonies on the same type of place as our fir.⁶ *Use*: The bark is full of blisters containing clear, liquid turpentine which is tapped off and used for various purposes in medicine. *Care*: This plant is sown and handled in the same manner as our Swedish fir.

3. *Abies minor, pectinatis foliis, Virginiana, conis parvis subrotundis.*⁷ Plukn.;⁸ Mill. Sp. 3. This is called *perusse* by the French in America. It grows in North America in such places as our spruce. *Use*: A reddish brown dye is made from the bark which is also excellent for sores. Otherwise the three firs just mentioned are used in much the same way as ours. *Care*: It is sown and planted in the same way as our Swedish fir.

4. *Acer*,⁹ called the sugar maple (in Mill[er's] discussion of cultivation). It grows in good, loose soil in Canada, the northern part of the Province of New York, and the Blue Mountains.¹⁰ *Use*: Both in Canada and the English Colonies quantities of sugar are made each year from the sap which runs from this tree. The American savages manufactured this sugar long before the arrival of the Europeans. Since the wood is

⁴ *Picea canadensis* (Mill.) BSP.

⁵ *Abies balsamea* (L.) Mill.

⁶ The references to "Blue Mountains" in his journal indicate that Kalm used the term for all the mountains in the eastern part of the present United States. "These mountains which the English call the Blue Mountains, are of considerable height and extend in one continuous chain from north to south, or from Canada to Carolina."—Benson, *The America of 1750: Peter Kalm's Travels*, 1:65.

⁷ *Tsuga canadensis* (L.) Carr.

⁸ Leonard Plukenet, *Opera Omnia Botanica*, 1(2), plate 121, fig. 8 (London, 1720).

⁹ *Acer saccharum* Marsh.

¹⁰ See footnote 6.

quite hard, it is used for cog-toothed wheels, cooperage, and various types of cabinet work. This and plant No. 64 listed below give the greatest heat of any of the wood used for fire in North America. *Care*: It is sown and handled in the same manner as our maples usually are; namely: The seed is planted (preferably as soon as it ripens) in a bed of ordinary garden soil and covered with about a half an inch of sandy mould. The plants begin to come up the following spring and should be kept free from weeds. The following autumn (if they are too crowded) they can be planted in a nursery in rows 3 feet apart with 2 feet between each plant in the row. Here they may remain for 3 or 4 years until they are sufficiently large to set where one wishes.

5. *Acer*.¹¹ Linn., *Hort. Ups.*,¹² p. 94, Sp. 2; Mill. Sp. 4. The maple with red flowers grows in swampy, wet places over all of North America, but also does well on other soil if it is not too dry and sandy. It is now commonly planted in English gardens where it blooms yearly and produces ripe seed. Those who wish to obtain such seeds may write for them. *Use*: In North America a quantity of sugar is yearly made from the sap in the same manner as in the foregoing. The wood is used for all kinds of cabinet work such as bureaus, desks, cupboards, chests, boxes, tables, chairs, and gunstocks. A dark blue dye and a black ink are obtained from the bark. *Care*: It is sown and planted in the same way as the preceding plant. It should be noted in the care of this maple as well as others that if the seeds can be had as soon as they are ripe they should be sown immediately. Otherwise, they are spoiled or their germination is retarded by long storage. The tree can be propagated early in the spring by burying young branches which have been notched in the manner customary in pinks. By this method the branches produce sufficient roots to be planted within a year. Trees of this type should not be exposed to rough weather when they are young.

6. *Actaea racemis longissimis*.¹³ Gron. *Virg.*, 57.¹⁴ The Swedes in America called it rattleroot because the seeds rattle in the capsules. It grows in good, rich, loose, black mould under and between broad-leaved trees. *Use*: The roots are good for treating pleurisy and no less valuable in treating inflammations. *Care*: This plant is sown in good soil and kept free from weeds. The root is perennial.

7. *Andromeda foliis ovatis*.¹⁵ Gron. *Virg.*, 160. It is called the spoon tree by the Swedes living in America because the savages and even the Europeans make spoons from it. It grows on hillsides in good soil. *Uses and characteristics*: The leaves resemble laurel leaves and remain on the tree the entire year. It is an ornament when it is in bloom. There is something poisonous about the leaves, for when sheep and calves eat them it usually means certain death, whereas stags can eat them without any ill effects. The wood resembles that of boxwood and is used for the same purposes. *Care*: The seed is sown in a bed of good duff preferably in shade, watered in dry weather, and kept free from weeds. This is a tree which does not readily come up when the seeds are planted, although it is evident that in nature propagation is largely by seed.

¹¹ *Acer rubrum* L.

¹² In the present translation as well as in the original Swedish text, the botanical abbreviation, "Linn. *Hort. Ups.*," refers to Linnaeus, *Hortus Upsaliensis* (Stockholm, 1748). Kalm also used "Linn. *Hort. Upsal.*" occasionally.

¹³ *Cimicifuga racemosa* (L.) Nutt.

¹⁴ In the present translation as well as in the original Swedish text, the botanical abbreviation, "Gron. *Virg.*," refers to Joannes Fredericus Gronovius, *Flora Virginica* (Leiden, 1743).

¹⁵ *Kalmia latifolia* L.

8. *Andromeda*,¹⁶ called ground laurel, grows in poor, dry pine barrens. *Uses and characteristics*: This bush belongs to the same genus as No. 7, and both are called *Andromedae*, although they form an entirely new genus. This plant, like the one above, is poisonous to sheep, calves, etc., who venture to eat its leaves. When in bloom it is most ornamental. *Care*: It is sown in the same type of soil as that in which it is found in nature, and kept free from weeds.

9. *Anona foliis ovato-lanceolatis glabris nitidis planis*.¹⁷ Linn. *Hort. Cliff.*, 222;¹⁸ Gron. *Virg.*, 61. In English this is called papaw; in French, *acimine*. It grows in good, loose, black mould in the forests of North America but not north of lat[itude] bor[éal] 40°. *Use*: The fruit of this tree has a marvelous flavor which compares favorably with most fruits. *Care*: The seeds are planted in good, loose soil in pots which are set in hotbeds to force them. The plants are then cared for in much the same way as lemon and Seville orange trees. Although *acimine* grows in localities where the Celsius thermometer drops to 24° below zero, I am afraid that it is a delicate tree. It was my duty, however, to collect seeds from it.

10. *Aparine*¹⁹ is called *tisavojaune rouge* by the French in Canada. It grows in good, loose, black mould here and in the Canadian forests. *Use*: From the roots of this plant savages make a beautiful red dye which does not fade. Although I looked far and wide this summer, I was able to find only a few seeds. *Care*: It is sown in good, loose, moist, black mould which had better be moist than dry, and weeded. It can later be propagated from roots.

11. *Apocynum*.²⁰ Gron. *Virg.*, 28. This is called wild hemp. It is common in North America, growing in forest meadows and on wooded land. *Use*: The fibers of this plant do not rot readily and are used in place of hemp or linen for string, rope, nets, and fishing lines. The fibers are very coarse and are used as reins. *Care*: It is sown in moderately rich, moist soil. After one has succeeded in growing the plants they can be propagated by roots.

12. *Aquilegia*.²¹ Gron. *Virg.*, 59; Mill. Sp. 6. Grows in sandy soil. *Use*: Merely for variety and as an ornamental in the garden. *Care*: Similar to that of other *Aquilegias*.

13. *Aralia caule folioso inermi*.²² Linn. *Hort. Ups.*, 70; Mill. Sp. 1. *Speeknel*, as it is called in English, grows in rich, damp, black soil throughout the forests of North America. *Use*: I myself have seen proof that no better plant can be found for treating sores than this one; the root is particularly good. It is also good for those who suffer from stone. *Care*: It is sown in good, rich soil and kept free from weeds. The seeds lie in the ground a year and occasionally longer before they emerge. The plant can be propagated by roots. Last year I sent a quantity of these seeds home.

14. *Arum folio enervi ovato*.²³ Gron. *Virg.*, 113. This is called *Taki* by the Swedes

¹⁶ *Epigaea repens* L.

¹⁷ *Asimina triloba* Dunal.

¹⁸ In the present translation as well as in the original Swedish text, the botanical abbreviation, "Linn. *Hort. Cliff.*," refers to Linnaeus, *Hortus Cliffortianus* (Amsterdam, 1737).

¹⁹ *Galium tinctorium* L.

²⁰ *Apocynum cannabinum* L.

²¹ *Aquilegia canadensis* L.

²² *Aralia racemosa* L.

²³ *Arisaema triphyllum* (L.) Schott.

and American savages. It grows in swamps and wet, marshy places which are difficult to penetrate. *Use*: The fruit is used in various ways as a food by the savages, but it is not particularly palatable. Cows are very fond of the leaves. *Care*: The plant is sown in places similar to those in which *Calla* and *Menyanthes* grow.

15. *Asclepias caule erecto simplici annuo*.²⁴ Linn. *Hort. Cliff.*, 78; Gron. [*Virg.*], 27. This is called *cottonier* by the French, and it grows in good, rich, loose soil or black mould on hills and river banks. However, it is not found in wet places. *Use*: The French take the first shoots that emerge in the spring and eat them like asparagus, although one would believe this species poisonous. The poor use the wool which surrounds the seeds for making feather ticks. Sugar is cooked from the flowers. *Care*: It is sown in rather good soil, kept free from weeds, and may be propagated by roots.

16. *Asclepias floribus fulvis*²⁵ is *Apocynum*, Mill. Sp. 9. It grows in outlying ground and in orchards in both loose and hard soil. *Use*: The roots are good for hysteria and bad stomachs. *Care*: It is handled in the same way as the preceding plant.

17. *Azalea ramis infra flores nudis*.²⁶ Gron. *Virg.*, 21. Called mayflower by the Swedes in America, this plant grows in good soil in forests. *Use*: It has pretty red or white flowers and a nice odor, and is used for decoration just as we use tulips and honeysuckles. *Care*: This plant is sown in good, loose, moderately moist soil, watered occasionally, and kept free from weeds. The tender plants should be shaded during the hottest part of the day. They are difficult to raise from seed.

18. *Bartsia foliis alternis*.²⁷ Linn. *Hort. Cliff.*, 325; Gron. *Virg.*, 68. Grows in damp meadows and outlying ground. *Use*: The only use of this plant is as a garden ornament, the flowers being of a beautiful cochineal color. *Care*: Some of them may be planted in ordinary garden soil which is not too dry and some in meadows which are a little damp. Although this plant looks almost like our own, it is more difficult to grow from seed.

19. *Calabasser*,²⁸ large, belongs to *Cucurbita*. Linn. *Hort. Ups.*, 291, Sp. 1. It is also under the same name in Miller. It does not grow wild in North America, but is planted because of its usefulness. *Use*: Both Europeans and savages use the fruits for making all kinds of vessels such as scoops, bowls, bottles, funnels, and cups. Nothing better can be found for storing seeds than these vessels. *Care*: Same as pumpkin.

20. *Calabasser*, small. This is a very small variety of the preceding plant and is planted for the same purpose. None of them can be used for food as they contain nothing but seeds. *Use*: Same as the one above. *Care*: Also the same.

21. *Carpinus squamis strobilorum inflatis*.²⁹ Linn. *Hort. Cliff.*, 477; Gron. *Virg.*, 118; Mill. Sp. 3, 4. It is called *bois dur* by the French, *Yserhout* by the Dutch, and ironwood by the English. It is a water beech with hop-like seed capsules and grows in tolerably good soil in forests and often in very poor soil. *Use*: The wood is quite hard; therefore, it is used for cog-toothed wheels, lantern wheels, axles for cart wheels, and clubs. *Care*: The seed is sown in shady places and ordinarily lies in the ground until the next spring or longer before it emerges. The plot should be kept free from weeds, and if the plants are too crowded when they first come up, they should be moved to a

²⁴ *Asclepias syriaca* L.

²⁵ *Asclepias tuberosa* L.

²⁶ *Rhododendron nudiflorum* (L.) Torr.

²⁷ *Castilleja coccinea* (L.) Spreng.

²⁸ *Lagenaria vulgaris* Ser.

²⁹ *Ostrya virginiana* (Mill.) K. Koch.

nursery where they remain for 2 or 3 years before the final transplanting. They can also be propagated by means of branches placed in the ground.

22. *Carpinus squamis strobilorum planis*.³⁰ Linn[aeus], *Flor[a] Svecica* (Leiden, 1745)], 786; Mill. Sp. 1. This is our Swedish water beech. It grows in forests on rather poor soil and is called *bois blanc* by the French. *Use*: Same as the preceding. Both No. 21 and this plant make beautiful hedges around vegetable gardens and orchards. *Care*: Same as No. 21.

23. *Castanie tree*.³¹ *Castanea*, Mill. Sp. 1 It grows wild in the forests of North America, often on poor dry soil. It is occasionally planted in yards by the inhabitants. *Use*: The nuts or chestnuts are not quite as large as those of the Spanish, but nearly as good in flavor, and are used in various ways as food. The wood resists rot for a long time and is usually considered the most durable wood for fences, posts, shingles, bridges, and punts. The savages not only make their boxes, scoops, and other vessels from the bark but also their boats which are made from one piece of bark and occasionally are large enough to carry eight persons. Smiths think very highly of the charcoal made from the wood of this tree. *Care*: The quality of chestnuts can be tested in this manner; if they are placed in water, the good seeds will sink and the bad float. They are sown in good soil which has not been manured, much like beans, in rows 4 inches deep and 4 inches apart, with the embryo turned upward. From my experiments I found that those which do best are barely covered with soil, shaded, and covered with moss or something else to retain the moisture. Care is taken to prevent mice from digging up the nuts. The plants emerge in 2 months. They are kept free from weeds and allowed to remain in the same place for 2 years, before transfer to a nursery.

24. *Chinquapin*.³² Gron. *Virg.*, 116; *Castanea*, Mill. Sp. 3. This is called *Små Castanier* by the Swedes in America. It grows in poor, dry soil in the forests of Pennsylvania or what was previously called New Sweden. *Use*: The tree is about the size of our hazel and bears a quantity of nuts each year which are smaller than those of the *Castanea* but equal in flavor. These nuts are used for the same purposes as the *Castanea*. In America they ripen at the end of the month of July. *Care*: The nuts are planted in the same way as the *Castanea*, but no nuts are so difficult to send from one place to another as these, for they lose their power to germinate in an incredibly short time. I also have this one among my living trees.

25. *Ceanothus*.³³ Linn. *Hort. Cliff.*, 51; Gron. *Virg.*, 25. It is called Jersey tea in America, and is common in fairly dry soil on wooded hills and in forests. *Use*: Some use it in place of tea, doubtless because the seed capsules resemble rather closely those found with tea leaves. Some savages treat venereal diseases with the roots of this plant. *Care*: It is sown in fairly good, rich, loose, garden soil in the sun, kept free from weeds, and watered when dry.

26. Cedar tree of Lebanon, *Cedrus Libani*, Mill. This tree does not grow in America, but I got cones of it in London and thought it would be a pleasure to have this famous tree in our gardens. I have seen large trees of it in England. It grows wild on the Lebanon mountains in Palestine. *Use*: In the beginning it will be only a curiosity, but if we find it does well here, and I have no reason to doubt that it will, the use may be considerable. One should, in particular, read what our illustrious historian, theologian,

³⁰ *Carpinus caroliniana* Walt.

³¹ *Castanea dentata* (Marsh) Borkh.

³² *Castanea pumila* (L.) Mill.

³³ *Ceanothus americanus* L.

botanist, professor primar and dean of Uppsala, Dr. Olaus Celsius, has written about this tree in his *Hierob. Bibl.*, as well as what Miller has in his *Dictionarium*, that, timbers of this tree have been found in the Temple of Apollo at Utica which were about 2,000 years old, etc.³⁴ *Care*: The best way to get the seeds out of the cones is to drive a nail lengthwise through the middle of the cone to split it so the seeds can be removed with the fingers. The method of sowing and planting is exactly the same as for spruce. I will not discuss this since it is to be found in the *Almanach* for the previous year. The chief difference is that these trees require more shade in the summer when they are small than spruce trees. The soil in which this tree thrived best in England was poor, dry gravel. When it is planted in good, rich soil, it does not do so well.

27. *Celtis fructu obscure purpurascente*, Tournes.³⁵ Mill. Sp. 1; Gron. Virg., 195. Called nettle tree because of the shape of its leaves. It grows in good, rich soil in the forest of North America. *Use*: Nearly everyone has one of these trees in his garden for variety, but no one eats the berries. *Care*: The berries, which lie in the ground 1 and occasionally 2 years before germinating, are sown in good garden soil which is kept free from weeds and exposed to the morning sun. Some sow them in boxes and cover them with a sandy mould. The following year they are set in hotbeds which greatly facilitates seed germination. It is not advisable to let these trees stay out in the open the first winter after they have come up as they are still too tender to stand the cold. They should be moved into a room which is not heated during the winter. This observation not only applies to this tree but also to many other foreign trees: They should be kept in a house the first, second, and sometimes the third winter while they are tender and full of sap; but later, when they are somewhat established and are no longer so sensitive, they can be set out in the open without danger.

28. *Cerasus sylvestris, fructu nigricante*.³⁶ Gron. Virg., 54. Wild cherry tree. It grows in forests and forest meadows as well as in hedges around yards in ordinary soil. It is now beginning to be badly cut away. *Use*: This is one of three trees of that locality that are used for all kinds of fine cabinet work such as bureaus, desks, cupboards, and chairs. In beauty it vies with No. 5 and No. 62; therefore, it is quite expensive. The wood is fine grained and of a yellow color. The older it gets, the more beautiful it becomes, and, for this reason, many prefer it to mahogany. *Care*: Is the same as that of other cherry trees which are planted from pits. It pays to cultivate this tree.

29. *Cercis foliis cord. pubescentibus*.³⁷ Linn. Hort. Ups., 99; *Siliquastrum*, Mill. Sp. 2. This is called *Sallad-Trä* in Swedish. It grows in fairly good, loose soil. *Use*: The flowers have a sour taste and are used for salad; thus the tree gets its name. It merits space in an arboretum for variety. It is pretty when it blooms, since the flowers, which are of a beautiful red color, appear before the leaves. *Care*: Seeds are sown in a bed of loose soil, preferably early in the spring, and germination is greatly aided by placing a little, green, horse dung under the bed. Soil is sifted over the seeds to a depth of about $\frac{1}{4}$ inch, and, if there is wet weather, the beds are covered with mats to protect them from too much rain which might cause the seeds to burst and rot. When the plants come up, they are kept free from weeds and are watered now and then during dry weather. During the first few winters, they are covered, or, if they are growing in boxes, they

³⁴ Olaf Celsius, *Hierobotanicon, sive De Plantis Sacrae Scripturae*, 84 (Amsterdam, 1748); Miller, *Gardeners Dictionary*.

³⁵ *Celtis occidentalis* L.

³⁶ *Prunus serotina* Ehrh.

³⁷ *Cercis canadensis* L.

are set in an unheated house until they reach the stage when they are to be planted out.

30. *Chenopodium*³⁸ is called worm seed. It grows in places similar to those in which nettles and pigweeds are found. *Use*: The seeds are fine as worm medicine for children. *Care*: It is sown in good, loose soil and kept free from weeds.

31. *Collinsonia*³⁹ Linn. *Hort. Cliff.*, 14; Collinson's herb. Grows in shady woods in choice, good, rich, musty, black mould. *Use*: It is quite good for the treatment of all kinds of aches. Decoctions are good for the treatment of rattlesnake bites. Horses eat the plant readily. *Care*: It is sown in the type of ground in which it is found growing in nature, although it must have more sun and be kept free from weeds. The plant may be propagated by roots.

32. *Cornus involucro maximo*⁴⁰ Linn. *Hort. Ups.*, 29; Gron. *Virg.*, 17; Mill. *Sp.* 7. This is called the dogwood tree by the Swedes and English living in America. In the forests it grows on nearly all types of soil on hills, hillsides, flat fields, and in swamps, but it seems to prefer flat, wet places which are not acid. *Use*: The tree is an ornamental in an arboretum because of its many, large, snow-white flowers which remain on the tree for a month if not longer. In addition it is nearly the hardest of all North American woods. It is used for making handles for chisels, clubs, planes, and hammers. *Care*: Seed is sown in good, loose, damp soil which is kept free from weeds. Seeds remain in the soil one year before they emerge. Later, when the stalks have come up, it can be propagated in the usual manner by branches placed in the ground.

33. *Cornus*⁴¹ called red osier. It grows in swamps on the sides of rivers and brooks and in other wet places. *Use*: It is used as wicker. Savages, and even the French, use the bark of this plant mixed with tobacco for smoking; others mix *Sagackhomi* (red bearberry) with it. For this purpose some prefer another species of *Cornus* from which stems of tobacco pipes are made. A decoction made from the bark is good for gout and even for anuria and is also effective in the treatment of aching bones caused by cold. *Care*: Except for the soil preference of this plant, the care is the same as that of the preceding one.

34. *Corylus*⁴², or hazel, grows in places similar to those in which our Swedish hazel grows and differs from it only slightly if at all. *Use and care* are also the same.

35. *Crataegus*⁴³, or hawthorn, with large red berries, grows here and there in the forests. *Use and care* are the same as those of the Swedish hawthorn, and the seeds also lie in the ground for 1 or 2 years.

36. *Crataegus*⁴⁴ called cockspur hawthorn, grows in places similar to the one above, and has the same use, and requires the same care.

³⁸ *Chenopodium ambrosioides* L. var. *anthelminticum* (L.) Gray.

³⁹ *Collinsonia canadensis* L.

⁴⁰ *Cornus florida* L.

⁴¹ *Cornus stolonifera* Michx.

⁴² *Corylus americana* Walt.

⁴³ "The confusion in the pre-Linnean descriptions of the American Hawthorns makes it impossible in some cases to determine which species different authors intended to describe; but it is apparent that some of the descriptions which have usually been thought to refer to *Crataegus coccinea* relate rather to *Crataegus Mollis*, which was well figured by Plukenet."—C. S. Sargent, *The Silva of North America*, 4:97, in footnote 3 (Boston and New York, 1892). The hawthorn with the large red berries which is described under No. 35 may well be *Crataegus mollis* (T.&G.) Scheele.

⁴⁴ *Crataegus Crus-galli* L. is the species commonly referred to as the Cockspur Hawthorn. It is considered the best of American Hawthorns to plant in hedges.

37. *Crataegus spinosa, foliis lanceolatis serratis*.⁴⁵ Sausage-skewer hawthorn. Grows in places similar to the preceding hawthorn but is less common. *Use and care* are nearly the same, although it is not as good for hedges as those just mentioned, because it loses its leaves early in the autumn. All these hawthorns have quite long sharp thorns.

38. *Cucumis*⁴⁶ or gherkins do not grow wild, but are cultivated by the inhabitants. I only collected the seeds in order to see what difference would be brought about by such long-distance moving.

39. *Cypressus Americana, fructu minimo*.⁴⁷ Mill. Sp. 5. It is called *Hvit En* by the Swedes and white cedar by the English. It grows in swamps and in low, wet places, but preferably in swamps which have beneath them a sandy bottom. *Use*: Nearly all the roofs in Pennsylvania and New Jersey are thatched with white cedar. It is incomparable for this purpose, since it is the lightest weight wood to be found, and vies with red cedar in durability. It is also used for timber, flooring, staves, casks, hoops, and posts to be placed in the ground. Some people use the shavings in place of tea. *Care*: The seeds should be sown in boxes, full of loose, fresh soil, placed where they will have the morning sun until 11 or 12 o'clock. They should be watered sufficiently and kept free from weeds. The boxes should stand out of doors until autumn and then be placed in a cold room since the plants do not come up until the first spring after they are planted and occasionally not until the second spring thereafter. The boxes remain in the cold room for the entire winter and are set in moderate hotbeds the following spring. Because of this the plants come up more quickly and their growth is greatly accelerated. They are exposed to the open air more and more later in the spring, and in May they are set in a shady place where they can still get the morning sun. They are kept free from weeds and watered well during dry weather. The following winter they are put under cover in a cold room, for the seedlings are weak and much more sensitive than they will be when they have become established. During the following April just before the branches begin to produce shoots, they are carefully taken from the box and set in a bed of good soil in a warm place in rows 1½ feet apart. This and other tree transplanting should always be done during cloudy or rainy weather and not during drought. Above all things the roots must not be allowed to remain out of the ground for long. The plants are watered after transplanting, and moss or something similar is placed over the roots to prevent drying by the sun. The plants remain here until they are 2 or 3 years old and 2½ to 3 feet high. They are then transplanted to the desired place. Transplanting should always be done during cloudy weather, and as much soil as possible is kept with the roots during the transfer. If the weather is dry they are watered 2 or 3 times a week until fully rooted. While the plants are still in the nursery and later when they have been permanently transplanted, the ground around the roots should be cultivated each spring in order to stimulate growth. This method is used in England, but it would also be worth while to sow these seeds on knolls in swamps in order to see how they would do. Since I have not found this plant in the parts of North America where the winters are extremely cold, it is possible that although it is a swamp plant in the south, further north it may do better on slightly higher places similar to those on which our common fir is found.

40. *Diervilla*.⁴⁸ Linn. Hort. Ups., 42; Mill. Grows on wooded hills in loose clay

⁴⁵ This may be *Crataegus Crus-galli* L.

⁴⁶ *Cucurbita sativus* L.

⁴⁷ *Chamaecyparis thyoides* (L.) BSP.

⁴⁸ *Diervilla Lonicera* Mill.

mould. *Use:* This plant is considered a sure cure for gonorrhea and is also considered very good in the treatment of anuria. *Care:* It is sown in fairly good soil which is not too wet and not too dry and is kept free from weeds. It is also propagated by slips and cuttings.

41. *Digitalis corolla quinquefida, foliis oppositis*.⁴⁹ Grows in forests, on wooded hills and open places in loose, middling good soil. *Use:* It merits a space in the garden because of its beautiful, large, yellow flowers. In addition, it is used in the treatment of pains of the chest. *Care:* It is sown in the same way as other flowering plants.

42. *Digitalis fol. linearibus, flor. remotis*.⁵⁰ Gron. *Virg.*, 72. This grows on damp, somewhat low-lying fields. *Use:* It is pretty when it displays its purple flowers. *Care:* It is planted like other flowering plants, although the soil must be taken into consideration.

43. *Diospyros*.⁵¹ Gron. [*Virg.*,] 156; *Guajacana*, Mill. Sp. 3. It is called persimmon in English and *Mispel-trä* by the Swedes in America. It grows in damp places around pools in clay and on damp meadows, although it does well in all types of soil, provided they are not too dry and sandy. *Use:* The fruit is seldom good to eat until it has been frostbitten; then it is sweet. If it is eaten before it is ripe and frosted, it is so astringent that the mouth is nearly drawn shut. From the ripe fruit, wine, brandy, and good small beer are made. It is also used for various confections. The wood is used for joiner's tools. *Care:* The seeds are planted in a moderate hotbed. When the plants come up, each is placed in a small pot filled with fresh, loose, sand mould. The pots are then placed in another moderate hotbed where they remain until the plants are rooted. The plants are transferred to the open air and in the middle of the summer placed where they will not be exposed to the wind. The first autumn they are placed in an orangerie for the winter; in the spring following, they are taken out of the pots and planted in the open in fairly dry soil where they are not exposed to strong winds. Later the plants are propagated by slips or cuttings.

44. *Filipendula foliis ternatis*.⁵² Linn. *Hort. Ups.*, 131; Gron. *Virg.*, 55. Grows in groves and forest meadows in good soil. *Use:* The root is used in place of *ipecacuanha*. It has cured many people from burns. *Care:* It is sown in good, rich soil and kept free from weeds.

45. *Fol avoine*,⁵³ so-called by the French, is *Zizania*. Gron. *Virg.*, 189. Called wild oats by the English, that is wild *Hafre*. It grows in mud on wet bottoms along ocean inlets, streams, and ditches in marshes—in a word, in places similar to those in which *Poa Jättegroe*, *Scirpus palustris altiss.*, and *Swinswingel* grow.⁵⁴ *Use:* In North America, where the plant grows wild, it is used as food by all the savage nations who yearly collect quantities. Various Frenchmen told me that this is not only as good as but even better than rice as a food. It seems to have been verified that the rice bird or *Ris-fogel* who only lives on ripe rice remains in the northern provinces during the month of August until all the rice there has been eaten and only returns to Carolina after the rice in that locality has ripened. Wild ducks are particularly delicious when the rice is ripe, for at that time they live on it almost entirely. If we could succeed in getting this rice to grow

⁴⁹ *Gerardia flava* L.

⁵⁰ *Gerardia purpurea* L.

⁵¹ *Diospyros virginiana* L.

⁵² *Gillenla trifoliata* (L.) Moench.

⁵³ *Zizania aquatica* L.

⁵⁴ *Ferula communis* L., *Scirpus americanus* Pers., and *Festuca*.

and ripen here we would have gained a great deal, for the wettest places would become as productive as fields if the plant would stand our winters. Cattle are more than greedy for the leaves and stalks. *Care*: The greatest difficulty will be to find a method of sowing the seeds so they will germinate. Since the roots are 1, 2, 3 or 4 *quarter* below the water, might it not serve our purpose to place the seeds in small balls of mud and sink them to the depth of $\frac{1}{2}$, 1, 2, or 3 *quarters*?⁵⁵ We still know very little about nature's method of sowing the seeds of plants growing in water.

46. *Gentiana caule ramisque ramosissimis*.⁵⁶ Gron. *Virg.*, 29. Grows on flat ground which is not too dry and sandy. *Use*: It is fine for wounds. *Care*: It is sown in the same type of soil in which it is found growing.

47. *Ginseng*, is *Panax foliis ternis quinatis*.⁵⁷ Gron. *Virg.*, 147. It grows in good, rich, deep, dampish, black mould in woods among broad-leaved trees. *Use*: The Chinese value the root so highly that it is worth its weight in silver. They believe it to be a panacea against all sickness. A large trade in ginseng is now carried on in Canada, and, at Quebec, in the autumn of 1748, it brought 6 francs a *skålpund*.⁵⁸ At other times it has brought 100 sols a *skålpund*. It is shipped from Canada to France and from there to China, whereby the traders are said to make a considerable gain. The French themselves know of no use for the plant, although some of them said it was good for asthma, for a weak stomach, and to give strength for *propagation em liberorum*. *Care*: The seeds should be sown in the kind of soil in which the plant grows in nature. From experience I know that the plant cannot stand exposure to direct sunlight; neither should it be placed in a warm cellar during the winter. It requires such special soil that it would scarcely pay to grow it for trade. In a few years it may become extinct in America, because quantities are taken out by the roots before the seeds have ripened. It is now considerably more expensive in that region than it was formerly.

48. *Gleditsia*.⁵⁹ Gron. *Virg.*, 193; Linn. *Hort. Ups.*, 298. I am not certain that this is *Gleditsia*, for the flowers differ greatly from the characters in [Linnaeus], *Gen[era] Plant[arum]* (Leiden, 1737)]. However, in all the English Colonies in which it grows, it is called honey locust, that is, *Honungs arte-tradet*, because the ripe pods are full of pulp which has a flavor as sweet as honey. Although rather rare, it grows here and there in the forests of Pennsylvania in rich, loose, black mould, and I have seen it do well on poorer soils. *Use*: The tree is quite pretty and has almost the same kind of leaves as the Siberian pea tree, but it is larger and has thorns which are a *quarter* or more in length. Small thorns, one after the other, often grow from the large thorns. Geese are quite fond of the pods which are over a span long. *Care*: The peas are planted in a hotbed, and when the plants come up, they are transferred to pots full of loose, fresh soil and then set into a moderate hotbed. They are watered and kept in the shade until they have taken root. The procedure after this is much the same as that followed in No. 43 except that these plants are more sensitive and must not be exposed to the north and west winds. A longer time must elapse before they can be allowed to stand in the open during the winter.

49. *Glycine foliis pinnatis alternis*.⁶⁰ Linn. *Hort. Ups.*, 226; *Conf.*, Gron. *Virg.*, 85;

⁵⁵ *Quarter* is $\frac{1}{4}$ *aln* or 6 inches.

⁵⁶ *Gentiana Saponaria* L.

⁵⁷ *Panax quinquefolium* L.

⁵⁸ *Skålpund* is a Swedish pound, 0.425 Kg. = 13.7 troy oz.

⁵⁹ *Gleditsia triacanthos* L.

⁶⁰ *Apios tuberosa* Moench.

Apios, Mill. It is called *Hopnis* by both the savages and Swedes in America. It grows in good, loose, black mould in forests and groves. *Use*: The roots are used like potatoes for food, and the savages also eat the peas. *Care*: It is sown in good, loose mould, kept free from weeds, and supplied with poles or sticks to climb on. It is propagated by roots like the potato.

50. *Gnaphalium* is called life everlasting. It grows in quantities on highlands and pastures as well as in abandoned fields. *Use*: The plants are put in flowerpots for house decorations, as the flowers always look fresh—hence their name. The plant is much used for treating swellings and bruises.

51. *Gossypium herbaceum*. Linn. *Hort. Ups.*, 203. This is the common cotton of the kind which must be planted every year. It does not grow wild in North America, but is cultivated in the Southern English Colonies. Observations which have been made in this connection demand attention. The English first supplied themselves with seeds from Providence and began to cultivate the plant in South Carolina at about 35° north latitude where it ripened pretty well. Even in this day, if seeds were taken from Carolina and sown in Pennsylvania which lies at 40°, they would not ripen, and there would be still less chance of their ripening in New York which lies at 41°. Nevertheless, cotton now ripens in New York. This was brought about in the following manner: After the cotton had been cultivated in Carolina for a time, seeds were obtained by individuals living in the colony adjacent on the north—the Province of Virginia. At first the plants were delicate and the seeds did not ripen because the summers in Virginia were not as long and warm as those in Carolina, but eventually the cotton ripened there also. It was finally moved by the same method from Virginia to Maryland, from Maryland to Pennsylvania, from Pennsylvania to New Jersey, and from New Jersey to New York. In the last named locality I recently had the opportunity to see several stands in a garden which had ripened during the summer. I supplied myself with seeds from these stands in order that we might try to get it to ripen here. The same has been true of corn in North America where it was gradually moved further and further north. If corn is taken from Virginia and sown in New England, it will not succeed in ripening, although quantities are planted yearly in the last-named locality and even further north, and much of it ripens. However, it has been moved by degrees in the manner just described.

52. *Hamamelis*.⁶¹ Gron. *Virg.*, 139. This is witch hazel, and it grows in forests in ordinary soil. *Use*: Fumes from a decoction of the bark are incomparable in treating eye diseases. With them I saw a savage cure a boy who had been almost stone blind for a half a year. *Care*: Seeds are sown in loose soil, and the soil is kept free from weeds.

53. *Hedysarum petiolo communi quoque setis duabus praedito*⁶² is common on poor, dry, wooded hills as well as on dry sea beaches and river banks and among bare rocks. *Use*: It always comes up from the root. Horses and other animals eat it readily. The poorest waste places could be made useful by sowing this plant. *Care*: Seed is sown and raked in the customary manner. In order to have a permanent source from which seeds may be obtained, they should be planted in beds in a nursery. In a word, seeds should be sown in the same way as those of sainfoin or lucerne since this plant is a member of the same genus as sainfoin.

⁶¹ *Hamamelis virginiana* L.

⁶² This may possibly be *Desmodium* or *Lespedeza* but the description is inadequate for definite determination.

54. *Hedysarum parvum*, *seminibus laevibus*.⁶³ Small sainfoin. Grows on poor dry hills in gravel. *Use*: The uses appear to be the same as those of the preceding plant. In addition it has the advantage of being quite succulent. *Care*: The same as for the one preceding.

55. *Hedysarum leguminibus monospermis; foliis ternatis, foliolis lanceolatis*.⁶⁴ This grows in poor, dry places in the direct sunlight. *Use*: I know of no use for this plant since cattle never touch it even if they have the poorest kind of pasture. It might be well to sow it and later plow it under in order to enrich worthless land. *Care*: The same as for those preceding.

56. *Hedysarum leguminibus monosp. foliis ternatis, foliolis ovalibus*.⁶⁵ Grows in the same kind of soil as the one above and has the same characteristics. Cattle never touch it. *Use and care* are also the same as for the one above.

57. *Helxine caule aculeato*. Grows in good lowland soil. *Use*: It is a species of buckwheat which always grows in swampy places; therefore, it might be grown to make such places useful. The seeds are quite small. *Care*: It is sown in wet soil and kept free from weeds.

58. *Hibiscus fol. ov. cren. pubescentibus*.⁶⁶ Seems to be *Hibiscus*, Linn. *Hort. Ups.*, 205, Sp. 10. It grows in good, damp soil in low-lying meadows around salt pits near Lake Onondaga. *Use*: The flowers are quite pretty and resemble those of hollyhocks. *Care*: The seeds are planted in the spring in a moderate hotbed. When the plants come up they are transplanted to pots filled with good, loose soil and transferred to another hotbed in order to stimulate growth. They are set out in the open air during the summer but placed in an orangerie the following winter. The next spring they are taken out of the pots and planted in the ground in a warm place. This is the method of cultivation in England. See Mill. under *Ketmia*, Sp. 8 and 9. Since the plant came from further north it is hardier.

59. *Ilex fol. ovatis acutis spinosis*.⁶⁷ Linn. *Hort. Ups.*, 32; *Aquifolium*, Mill. It grows in good soil, in damp places, and occasionally in swamps. *Use*: It retains its leaves summer and winter, and is beautiful as a hedge for a garden. The leaves are good for pains or stings. The wood is beautiful for cabinet work. *Care*: The berries are sown in the usual manner in good garden soil. They usually lie in the ground 2 years before the plants emerge, and the practice is then the same as that for other trees.

60. *Impatiens pedunculis solitariis multifloris, caule nodoso*.⁶⁸ Gron. *Virg.*, 108. It grows in good, loose soil in the shade of thickets and forests. *Use*: Humming birds love the flowers, from which a yellow dye is obtained. *Care*: It is sown in good, rich humus in fair shade, and later it can be propagated by roots.

61. *Iris Amer. caerulea*.⁶⁹ Grows in lowlands and damp places in fairly good soil. *Use*: The roots are excellent for treating sores of the bone and equally good for incise wounds. *Care*: It is propagated like other *Irides*.

62. *Juglans foliolis lanceolatis*.⁷⁰ Linn. *Hort. Ups.*, 287; *Nux Juglans*, Mill. Sp. 7.

⁶³ *Ibid.*

⁶⁴ *Lespedeza capitata* Michx.

⁶⁵ *Lespedeza hirta* (L.) Hornem.

⁶⁶ *Hibiscus Moscheutos* L.

⁶⁷ *Ilex opaca* Ait.

⁶⁸ *Impatiens biflora* Walt.

⁶⁹ *Iris versicolor* L.

⁷⁰ *Juglans nigra* L.

The black walnut tree. It grows in the forests of Pennsylvania and New Jersey in good, loose soil. *Use*: The wood is exceptionally beautiful and is preferable to that of the European walnut for cabinet work. For this reason it is one of the most expensive woods found in North America. The roots are used in making bureaus, desks, cupboards, tables, chairs, boxes, and so forth. In other words, it is used for all kinds of fine cabinet work. In color and mottled veining, the wood of the roots is exceptionally beautiful and becomes more so with age. The nuts have a flavor which is just as good as the European walnut. An oil is obtained from them which is good for sore chests. A brown dye is made from the bark of the tree and particularly from the husk of the nut. *Care*: Planting and care are the same as for other walnut trees. I hope that a large number of these trees will be planted in Skåne where the climate is mild. The tree grows quite large. All of the walnut trees which are to be used for timber should be planted immediately in the place where they are to stand, since the roots grow deep, and if broken the tree does not grow erect but produces many branches. The trees which are to be used as nut trees are greatly benefited if they are transplanted, for this causes them to produce more nuts of a larger and better quality. It is common knowledge that roots which grow deep tend to increase the growth of the tree for timber, but trees having shallow horizontal roots are most fruitful. In transplanting special care should be taken never to cut or bruise the roots or branches since either might prove quite injurious; neither is it wise to be too diligent in pruning, for the tree is easily killed. If one wishes to cut away a few of the branches, this should be done in late spring or early autumn so that the wound can heal before cold weather. The best time for transplanting these trees is when the leaves begin to fall. If they are carefully taken up and the twigs and branches uninjured, there is no doubt that they will live even though they are 8 to 10 years old. Nut trees should be planted 40 feet apart.

63. *Juglans alba*⁷¹ is called the white walnut tree. *Nux Juglans*, Mill. Sp. 8, 9. It grows in good soil on hillsides here and there in forests. *Use*: The nuts are used for food and confections like other walnuts, and the French women preserve quantities yearly. The nuts produce an oil which is used by painters in place of olive oil and by savages for greasing the hair and body. The wood is used for cogs and lantern wheels of mills. A black dye is obtained from the bark. *Care*: The care is the same as that of other walnut trees.

64. *Juglans*,⁷² which is called hickory, is also known as *Nötbom* by the Swedes in America. *Nux Juglans*, Mill. Sp. 8 and 9. This tree is common in the forests and grows on both good and poor soil. *Use*: There are several varieties of this walnut tree. The nuts are used for confections and food as in those just preceding. The savages make a tasty milk from the kernels of the nuts. The wood of this tree is considered the best of all trees in America since it produces so much heat that it vies with the sugar maple. The branches and shoots are quite tough and very difficult to break, and are therefore preferred to all others for hoops and withes. The wood is also used for ax handles, clubs, and hammers. Quantities of canes, some of which are exported, are made from a variety which has wavy veins. A yellow dye is made from the bark, and in the spring, a small quantity of sugar is made from the sap. In some localities the tender leaves are used for tea. Savages make bark boats from the bitter-nut hickory in the manner described in No. 23. *Care*: The same as that of other walnut trees.

⁷¹ *Juglans cinerea* L.

⁷² *Carya*.

65. *Juniperus foliis basi adnatis*.⁷³ Linn. *Hort. Cliff.*, 464, Sp. 2; Mill. Sp. 4. This is called *Röda Enen* by the Swedes in America because of its red wood. The English call it red cedar. It grows here and there in the forests, in dry, sandy soil on hills, in mountain valleys, and in places similar to those in which our cedar grows in Sweden. However, it grows to the size of such large trees as our fir and spruce. *Use*: The wood of this tree is considered the best in America for fencing and posts to be set in the ground, for it resists rot for a long time and is said to be nearly as durable as iron. It is used for nearly all purposes for which we employ fir and spruce. Yachts and small vessels are frequently made from the wood of red cedar. *Care*: The beds are made of good, loose soil to which no manure is added, and care should be taken to have the soil fine and even. The berries, which lie in the soil a year or more before the plants emerge, are planted quite thick and covered with soil to the depth of $\frac{1}{2}$ inch. The seed bed is kept free from weeds. After the plants have come up, they are carefully weeded and watered during dry weather to promote growth. The following spring new beds are prepared which contain exactly the same kind of soil as the first beds; here a specially made garden shovel is used in order to be sure that as much soil as possible accompanies the roots in transplanting. The plants are set 1 foot apart and watered in order to settle the soil around the roots. Should drought follow planting they should be carefully watered and the soil around the roots covered with moss or turf in order to prevent injury from sun and wind. However, the trees should not be watered too much because they are often killed by the younger roots or rootlets rotting away. Nearly all trees are better off if transplanted during cloudy or rainy weather. The plants remain in these beds for 2 years, but they must be kept free from weeds and the ground around them covered with moss or turf in order to keep the frost from reaching the roots. If they are exposed these plants are easily injured by frost when they are young but are not effected by cold when they are older. *Observations*: 1, When any tree is to be transplanted the very best way to prevent damage from sun and drought is to cover the roots with grass turf cut from outlying ground, turning the grassy side downward; 2, Manure is injurious to trees until they are well rooted; 3, The soil around the roots is carefully cultivated each spring in order to promote growth. This practice should be followed in the planting of all trees, particularly when they are still weak. At the end of 2 years the young trees are either transplanted to the nursery where they are planted 3 feet apart, or to the place they are to remain. In transplanting, the procedure given above is followed.

66. *Larix folio deciduo, conifera*.⁷⁴ Mill. Sp. 1, the *Lärk-trä*. This tree does not grow wild in America, but I obtained the seed from England where it is grown in gardens for variety. *Use*: In the beginning this tree may be grown as a curiosity. Abroad the best turpentine is obtained from it, and the *Agaricus*, used so much in medicine, grows on it. The timber is used in both the building of houses and ships and can also be polished. A ship which was built chiefly from this kind of wood was found in the Numidian harbor at a depth of 12 fathoms. The wood was so firm and hard the sharpest ax could scarcely cut it, although it had been lying in the water over 1,000 years. *Care*: It is planted in the same way as spruce and requires the same kind of soil. Seeds are sown in a bed of good garden soil exposed to the morning sun, or, in boxes containing the same kind of soil, in order that they may be placed in the morning sun. They should be protected from birds who readily pull them up, watered carefully in dry weather, and kept free

⁷³ *Juniperus virginiana* L.

⁷⁴ *Larix decidua* Mill.

from weeds. They should not be exposed too much to either sun or wind, for both are injurious to the young plants. In the autumn the boxes are put where the young plants are not exposed to the cold weather which occasionally injures them, but when they are a little older they are not sensitive to cold. The following spring the plants are placed in beds of good, loose soil 10 inches apart and watered during dry weather. Turf is placed on the ground above the roots. The plants are kept free from weeds and at the end of 2 years are transplanted to a nursery. Particular care is taken to keep as much soil as possible with the roots. The plants are placed 3 feet apart, watered, and covered with turf. It is best to transplant just before shoots are produced. The soil should be neither too wet nor too dry and should be kept free from weeds and cultivated every spring just as in No. 65. In several years the plants can be transplanted to permanent locations such as poor hillsides where few other trees thrive. Moving or transplanting, as previously mentioned, should always be done before shoots are produced. All types of *Larix* lose their needles in the autumn and get new ones in the spring.

67. *Larix folio deciduo, rudimentis conorum candissimis*. Plukn.; Mill. Sp. 2. This is a rare variety of the previous one which I also obtained in England. *Use and care*: The same as for the preceding.

68. *Larix Americana*,⁷⁵ called witch cedar by the English. In Canada it grows on hillsides and level ground which is not too dry, but further south it always grows in swamps. *Use*: Wood and fence material. *Care*: The same as that of No. 66.

69. *Laurus foliis lanceolatis enerviis annuis*.⁷⁶ Gron. *Virg.*, 159. The English name means spice tree because all parts of the tree have a peculiar odor. It grows on acid hillsides and in wet, swampy places. *Use*: The bark is used in treating horses for worms. *Care*: The seeds are sown in good, loose, damp humus exposed to morning sun and the plot kept free from weeds.

70. *Lilium foliis verticillatis, flore erecto*.⁷⁷ Mill. Sp. 15; Gron. *Virg.*, 37. It grows in poor, dry soil in forests and on wooded hills. *Use*: It would be an ornament in any garden because of its beautiful flowers. *Care*: Is the same as that of other species of lily, but it should be planted where it is not exposed to the north wind and should be covered during the winter.

71. *Lilium foliis verticillatis, floribus nutantibus*.⁷⁸ Mill. Sp. 32; Gron. *Virg.*, 151. *Use*: It is ornamental to the garden because of its beautiful flowers. *Care*: The same as for the one preceding.

72. *Liriodendrum*.⁷⁹ Linn. *Hort. Ups.*, 154; Gron. *Virg.*, 60. The tulip tree is called *Cano* tree or *Knu* tree because the Europeans and savages hollow out their canoes from its timbers. It grows in good, loose soil on level land in forests, although it is also found in wet places and on nearly all kinds of soil. *Use*: It is one of the largest and tallest trees in North America, although white pine, No. 96, and white oak, No. 105, vie with it. I have seen quite a large barn which was entirely made from boards which had been sawed from a single tree. The wood is used for boards, planks, all kinds of vessels, wood turning, and even for timbers. The leaves are good for headaches, and for worms in horses, but they are incomparable for treating gout and other pains of the legs. The

⁷⁵ *Larix laricina* (Du Roi) Koch.

⁷⁶ *Benzoin aestivale* (L.) Nees.

⁷⁷ *Lilium philadelphicum* L.

⁷⁸ *Lilium canadense* L.

⁷⁹ *Liriodendron Tulipifera* L.

leaves and flowers of this tree are peculiarly shaped. In some localities the tree is called an old-fashioned linen-cloth tree because the leaves have somewhat that shape. The flowers closely resemble tulips both in shape and size, although this species is widely separated from the genus from which it takes its name. It is, therefore, the most beautiful tree as to both leaves and flowers that North America possesses. For several weeks in May it is most agreeable to see trees as large as our largest oaks and firs covered with these beautiful flowers. They already have large trees in England that bloom yearly and produce fruit. Seeds are planted in pots or boxes filled with good, fresh, loose soil and placed in a moderate hotbed which is only covered with mats, not with glass, because the glass causes the soil to dry too quickly and ruins the seeds. These boxes and pots are frequently refreshed with water and when the plants come up they are set in the shade during the summer. In the winter the plants are placed so they can utilize the sun in mild weather but be covered during frost. The following spring they are taken up and each is planted in a separate pot filled with good, fresh soil. If these pots are placed in a hotbed under mats the plants root more quickly. The plants are allowed to stand in the shade during the summer and are placed in an unheated room in the winter. This is the procedure followed for 3 or 4 years until they are strong enough to transplant. The final location should be in good, loose soil, neither too wet nor too dry, and in the neighborhood of other trees, for they do better if they are not standing alone, provided they are not completely shut in by larger and taller trees.

73. *Lobelia caule erecto, foliis lanceolatis*.⁸⁰ Linn. *Hort. Ups.*, 276; Gron. *Virg.*, 107; *Rapuntium*, Mill. Sp. 1. The cardinal flower. It grows in thickets, forest meadows, and along rivers and streams in fairly good, damp soil. *Use*: If any flower is ornamental in garden and orchard, this one is, with its incomparable cochineal-colored flowers. *Care*: Seeds are sown in pots filled with loose soil where they are scarcely covered, for if they are planted too deep they do not come up. (*Observation*: This rule should be observed in the case of all small, fine seeds.) If these seeds are sown in the spring the pots are placed where there is no danger of cold injury. They must not be put in a hotbed for that would ruin the seeds. When it becomes warmer they are placed in the open where they can get the morning sun until 12 o'clock, and they are always watered during dry weather. Each plant is set in a pot of good, loose soil when it comes up. It is watered during drought and covered for frost. Some of them can be placed in beds in places where they are not exposed to the north wind. The plant can also be propagated by roots.

74. *Lobelia*,⁸¹ with large blue flowers, called the deer park flower. (I.C.H.G.)⁸² *Rapuntium*, Mill. Sp. 2. It grows along streams, rivers, brooks, and ditches in good, damp, and often quite wet, soil. *Use*: It is the sovereign remedy of the savages for syphilis. See the discussion in Kongl. Svenska Vetensk[aps] Acad[emiens] *Handlingar* [Royal Swedish Academy of Science's *Proceedings*] for 1750, page 180. It also deserves a place in the garden because of its beautiful flowers which are lovely. It has been cultivated abroad for a long time because of its beauty, although its great medicinal value was not known. *Care*: In England the seeds are sown and planted as in the one preceding, but this one is planted in beds of humus when it is fairly good sized. The plant dies

⁸⁰ *Lobelia cardinalis* L.

⁸¹ *Lobelia siphilitica* L. Pehr Kalm, "Lobelia, såsom en säker läkedom emot Veneriska sjukar," Kongl. Svenska Academiens, *Handlingar*, 11:280-290 (1750).

⁸² This abbreviation may refer to Johannes Claytonius in Herbarium Gronovius.

to the ground each year, but sends up new shoots and leaves from the roots the following spring. It is also propagated by roots.

75. *Magnolia foliis ovato-lanceolatis*.⁸³ Linn. *Hort. Cliff.*, 222; Gron. *Virg.*, 61; Mill. Sp. 1. The Swedes in America call it the beaver tree because the beavers prefer its bark to that of all other trees. For this reason it is used in trapping them. The tree grows in swamps and wet meadows. *Use*: This tree is also ornamental in arboreta. In North America it begins to bloom by the middle of May, and the flowers produce the most agreeable odor in the world. If the wind does not interfere, trees can be recognized at the distance of a *fjerdels* because of the sweet agreeable odor which fills the air.⁸⁴ Traveling through the woods at this time is an indescribable pleasure. The flowers bloom from 4 to 6 weeks and during the whole time scatter this refreshing odor. *Use*: An infusion from the berries is said to be excellent for diseases of the chest. A decoction from the bark is good for diarrhea, incomparable in the treatment of sores of the leg, good for catarrh, and is also used in treating pains and stings. Beavers are trapped with the bark. *Care*: The berries are sown in boxes of good soil set in a moderate hotbed which is shaded from the sun and watered often. The plants are transferred to the open air during the middle of the summer but are not exposed to the sun while they are young because it is injurious to them. In the autumn they are placed in an orangerie where the temperature is mild and the air fresh. They are transplanted the following spring and care is taken that as much soil as possible accompanies the roots. The plants are placed in pots filled with good, loose soil which is watered in order that it may settle around the roots. Plants that are exposed during mild weather and frequently watered must be covered during cold, windy weather. In a month's time they are set in a shady place in the open. For 2 years they are kept in pots and placed in unheated rooms during the winter. After this they may be planted out in quite wet places. It is better to protect the plants from violent north or west winds.

76. *Mala Cydonia*, or quince. *Cydonia*, Mill. It is not a native of America but has been brought from Europe and planted in orchards, although it frequently winter-kills. *Use*: The fruit is used in the same manner as apples, namely, raw, dried, or in tarts, wine pudding, etc. *Care*: The same as that of other orchard trees.

77. *Malus Sylvestris, floribus odoratis*.⁸⁵ Gron. *Virg.*, 55; Mill. Sp. 3. This is called crab apple tree by the Swedes in America. It grows here and there in the forests in fairly good soil. *Use*: The flowers have quite a pleasant odor. The apples are so sour they cannot be eaten but are used for vinegar. *Care*: The same as that of other apple trees.

78. *Mays*.⁸⁶ Called three-month maize, procured from Albany. This and other kinds of maize (which is otherwise called Turkish wheat) does not grow wild in North America but is cultivated by both Europeans and savages. It is one of the plants which the savages planted for food before the Europeans discovered America. It is an excellent species of grain which is the chief food not only of the savages but also of most of the people in the American Colonies. I know of no other species of grain which can be prepared for food in so many ways and which is of the same quality as corn, nor any which is as appetizing and fattening to all kinds of domesticated animals, both birds and beasts. If we can get this plant to grow and ripen in Sweden, and I have no reason to doubt

⁸³ *Magnolia virginiana* L.

⁸⁴ *Fjerdels* means $\frac{1}{4}$ of any given distance or measurement.

⁸⁵ *Pyrus coronaria* L.

⁸⁶ *Zea Mays* L.

that it will, more than one barrel of gold will be gained. It is a very productive grain, and if I do not get 200 times as much grain as I plant, I can consider it a crop failure. In America several kinds of corn are found, some take 5 whole months to ripen, others 3 to 4. Another kind is found in Albany (where each year cattle must be fed in barns for 6 months) which ripens in 10 and occasionally 8 weeks. Last summer, with my own eyes, I saw corn planted, and 5 weeks later it was sufficiently developed so that I ate roasted ears. I was fortunate enough to get a savage to supply me with a large quantity of this corn which is exceedingly rare even in North America. It is the one which I am describing under this number, and I consider it a great treasure. It is too late to plant corn here this summer, but on my way from Göteborg I left seeds many places in the country which were to be planted immediately. My patrons and friends who took them will undoubtedly report their observations to the Royal Academy of Science. At present I will give no further discussion, since, God willing, I plan to present, as soon as possible, a complete discussion of the planting and care of this plant together with its use as food for both man and beast to the Royal Academy of Science.⁸⁷ Thus, I will direct those who derive pleasure from experimenting with the cultivation of maize. The seed keeps best on the ear, therefore, a considerable quantity of them is left with the Kongl. Vetenskaps Akademien for distribution among those who wish to experiment with it. Since I was unable to supply myself with such quantities that each and every one might obtain an ear it would be best if the seeds were allowed to remain on the ear until next spring when those who are interested may obtain seeds from the Kongl. Vetenskaps Akademien.

79. *Mays*. Called three-month maize, from Quebec. This corn comes closest to the one just preceding in characteristics and excellence. The kernels of both are white.

80. *Mays*, blue. Called blue maize. This is one which is particularly used for brewing. However, it takes somewhat longer to ripen than those described above.

81. *Mays*, yellow. Called yellow maize; includes several kinds, some of which, I believe, would scarcely ripen to advantage here. However, one can experiment.

82. *Mays*, red or brown. Called red maize. There are several varieties of this type. I doubt if they would ripen to good advantage here.

83. *Melissa floribus verticillatis*.⁸⁸ Gron. *Virg.*, 167. This is called penny-royal. It grows in quantities on fields of poor, loose, high ground. *Use*: It is so strongly aromatic that one can get a headache from smelling it for a long time. It is much used as tea to cause sweating. Decoctions of this plant and *Cardiaca* are good for *Hectique*. *Care*: It is sown in the same way as *Kyndel* [*Satureia hortensis*] and other aromatic plants.

84. *Melo vulgaris*,⁸⁹ or melons, do not grow wild in America but are cultivated by both Europeans and savages. The savages, who are called Illinois by the French, together with their neighbors, have had both melons and watermelons or *Arguser* long before the Europeans came to America. I collected seed for the same reason as in No. 38. However, I collected seeds from those having an excellent flavor. *Use and care*: The same as those customary for melons.

85. *Melopepo*,⁹⁰ called squash, is a special kind of pumpkin which is particularly fine. So far as I know, it does not grow wild in America but is one of the plants which the sav-

⁸⁷ See the translation of Kalm's article on maize which is cited in footnote 1.

⁸⁸ *Hedeoma pulegioides* (L.) Pers.

⁸⁹ *Cucumis Melo* L.

⁹⁰ *Cucurbita maxima* Duchesne.

ages had cultivated for food from time immemorial, long before the Europeans discovered the New World. At the present time, they are as diligently planted by the Europeans as by the savages. *Use*: Squashes are excellent for food and are prepared in many ways. They have the advantage of remaining good and fresh for almost the entire winter. *Care*: The same as for pumpkins. They are usually sown early in the spring. The seeds remain viable for several years. It would be well worth while to cultivate them extensively.

86. *Monarda floribus coccineis*,⁹¹ called red mint. It grows in pastures and thickets and under broad-leaved trees in good, rich, loose, black mould. *Use*: If any flower is ornamental in a garden this one is, for it displays a large quantity of flowers of the loveliest cochineal color imaginable. In North America very small birds are a familiar sight during the summer. In English they are called humming birds, and the Swedes living there call them *Kungs-foglar* or *Honungs-foglar*. They are scarcely as large as the end of a finger and like bees they feed only on honey. They can nearly always be seen darting through the air around these flowers, which they prefer to all others, going from one to the other and sucking honey. *Care*: It is sown and cared for in the same way as mint. Later it is easily propagated from roots.

87. *Monarda floribus rosaceis*,⁹² called Oswego tea. It grows on dry soil in particularly large quantities on the large, open plains which are found in the forests of the land of the Iroquois, where, for some unaccountable reason, no tree grows in areas of a mile or more. *Use*: It has a pleasant, aromatic odor, and is considered a sure cure for over-eating. I have seen proof of this on several occasions. It is used in treating weak stomachs and contagious diseases. *Care*: The same as the one preceding, except that the type of soil must be considered.

88. *Morus nigra Americana*.⁹³ *Morus Virg.*; Mill. Sp. 5. The black mulberry tree of America usually grows in the forests of North America in fairly good soil which is neither too wet nor too dry. I have also seen it doing well on rather poor soil. *Use*: The fruit is very good to eat. No tree produces more fruit than this one; it is often nearly black because of the fruit. The berries are occasionally the size of the joint of a finger and are used in making wine and for various other purposes. The leaves are the food of the silkworm and the foundation of the silk industry. In several places in America I have seen silk spun by silkworms which were fed with the leaves of this tree. For several years a quantity of silk was sent to England from North Carolina. All of it was spun by silkworms which had been fed on these leaves. Similarly a governor of Connecticut, New England, kept for several years a large number of silkworms which he fed leaves from these trees. They spun all the silk that he and his entire family needed for clothing; similar instances from several other places could be given. I know that many people maintain that the leaves of the white mulberry tree are more desirable as food for the silkworm than those of the black, but this has still not been proven. I take the liberty to quote what Mr. Miller says in his *Gardeners Dictionary*. The words run thus: "The *White Mulberry* is commonly cultivated for its Leaves, to feed *Silk-Worms*. In *France, Italy, &c.* though the *Persians* always make use of the common *Black Mulberry* for that Purpose; and I have been assured by a Gentleman of Honour, who hath made Trial of both Sorts of Leaves, that the Worms fed with those of the Black Sort, produce much better Silk than those fed with the White; but he observes, that the Leaves of the Black Sort should never

⁹¹ *Monarda fistulosa* L. Possibly var. *rubra* Gray.

⁹² *Monarda didyma* L.

⁹³ *Morus rubra* L.

be given to the Worms, after they have eaten for some Time of the White, lest the Worms should burst, which is often the Case when they are thus treated." The wood is better than that of any other tree for dowels in ships and boats and is also used for various purposes in cabinet work. I believe I can be entirely certain that this type of mulberry tree can exist and thrive here without being injured by our winters. In the City of Montreal, Canada, in North America, I have seen large trees of it planted in dry, stony, sterile soil, that stood for many years without the least care. In that locality the winters are always as long and as cold as the winter here, yet the trees were not injured in the least. The winters, at the northern limit of the natural distribution of the mulberry, are usually colder than any of our winters. The frost reaches a depth of 3 feet and occasionally 5 feet so that it is necessary in digging graves for burial to use heat nearly to the bottom of the graves. People living in that locality must shelter and feed their cattle for 6 whole months and even longer. *Care:* No one has given a better account of how the mulberry tree should be sown and planted here in Sweden than the late Captain Trievald, who for several years was engaged in the planting of mulberry trees and the care of silkworms. This information is found in part in Kongl. Svenska Vetenskaps Academiens *Handlingar* [Royal Academy of Science's *Proceedings*] for the year 1745. Since it is possible that everyone does not have these *Handlingar*, I will quote that which concerns the sowing of the mulberry seeds and the discussion given, beginning on page 93. "It is not only possible to obtain thousands of young trees from seeds alone, but also, from the crown or root of a single tree, several thousand young trees can be obtained with little difficulty in a relatively short time. Those who have had experience will not find it difficult to believe the account in the Royal Academy of England, *Proceedings*, No. 12, page 201. A man in Virginia planted 10,000 mulberry trees exclusive of hedges on his ground and also seeded a field on which mulberry plants came up as thick as rye. In place of berberis, gooseberry, or currant, he has planted mulberry hedges from which one person with pruning shears could cut more leaves for silkworm food in one day than many persons could pick in the same time from mulberry trees. The safest and simplest way to introduce the breeding of silkworms into our dear fatherland is to follow the method used in Virginia and Georgia, America, namely, since good mulberry seeds are now coming into the kingdom they should be planted on burned-over lowland or on rutty meadows fertilized with ashes which I have found to be the best fertilizer for mulberry trees. In time, one not only obtains considerable food for silkworms but also millions of trees which are transplanted to nurseries when they are 9 feet tall. Later they can be planted along fences. The best soil for the planting of mulberry seeds is undoubtedly small burned-over valleys, where a light, loose mould lies exposed to the sun but is protected on the north by mountains and forests. Only such valleys are satisfactorily drained. In contrast, large mountains are entirely unsuitable for the purpose of burning over.

"If one wishes to establish a nursery from mulberry seeds in an arboretum or on a small plot of land, beds are usually made on loose, rich soil. When the seeds have been soaked for 24 hours they are thoroughly mixed with ashes, sand, or dry mould and planted in furrows 2 inches deep and 8 inches apart. If rain does not come shortly after sowing, it is necessary to place as much rye straw as can be held in the hand at one time parallel with the furrows in which the seeds have been sown, or *Björnmässa* [*Polytrichum commune*] may be used instead. First, this prevents the soil from separating from the seeds when the furrows are watered. Second, the soil will not dry out as quickly in the spring. It is extremely desirable to plant mulberry seeds in warm beds made as follows: dig plots 1

*aln*⁹⁴ deep for each bed, later fill the same with well-trampled stable manure mixed with straw. On top of this, place a half an *aln* of good duff. When the young mulberry seedlings show above ground they must be diligently watered and kept free from weeds. When winter approaches, the leaves which have fallen from various types of trees are gathered and the beds covered with them to the depth of a *quarter* the first winter. If these tender young trees come up very thick in the bed, as they usually do when the seed is good, those which are too crowded can be transplanted to a nursery. They may be transplanted in the spring if they have reached the height of an *aln* or more. Plants may also be allowed to remain in the bed until the beginning of October or the following May. They are then planted in a nursery 3 feet apart in straight rows, just as cabbage is planted, so that the plants of one row stand at right angles to those of the other. Now and then this tree tends to bush like elder; therefore, in the spring, when the root is 2 years old and the sap is beginning to run, I have cut away everything leaving only one bud which has shot up into a straight stem reaching the height of 10 *quarter* in one summer. When young mulberry trees are transplanted the roots are trimmed slightly, if at all, and dipped in water which has been standing in the sun. If trees with straight high trunks are desired, the plants must be trimmed regularly while they stand in the nursery. All lateral branches must be removed until the desired height is reached. Growth is greatly promoted by watering the young plants during periods of drought. They should be kept free from weeds and carefully cultivated around the roots during the latter part of May, July, and August. As soon as trees are available they may be propagated by cutting branches and placing them in good, loose mould 4, 5, or 6 inches deep. If diligently watered they not only form roots but grow extremely well. If one cares to take greater precaution a hotbed half an *aln* deep may be filled with straw and horse dung, and when the straw has been trampled down and covered with good loose mould to a depth of about $\frac{1}{2}$ an *aln*, the branches may be planted at a depth of 5 to 6 inches. They not only form roots but an unbelievable number of shoots during the summer." So much for Trievald. My only objection to this method is that he recommends burned woodland. In contrast, I wish that all burned woodland would be outlawed because of the indescribable damage to forest and field; otherwise the mulberry will be produced at too great a sacrifice. Mr. Miller among other things concerning the care of the mulberry says: "It may be propagated by sowing the Seed, . . . Those Plants which are propagated from Seeds are commonly the most vigorous, and generally make the straitest Stems, . . .

"This Tree delights in a light Soil, not too wet nor over dry, and should have an open Exposure; for if it be planted too near to other Trees or Buildings, so as to be shaded thereby, the Fruit seldom ripens well; though if they are planted in a Situation where they may be defended from the violent *West* and *South-West* Winds, which very often blow down and destroy great Quantities of the Fruit, it will be of great Advantage; but they should always be open to the *East* and *South-East* Sun, which is of great Service in drying up the Moisture which lodges upon the Surface of their Leaves in the Night, and not only retards the Fruit, but renders it ill-tasted and watry.

"The Soil under these Trees should also be every Year well dug and manured, tho' there will scarce any sort of Plants grow under them; but it is of great Advantage to the Fruit, notwithstanding what may have been said to the contrary. . . .

"The Trees which are design'd to feed Silk-Worms, should never be suffer'd to grow tall, but rather kept in a sort of Hedge, and instead of pulling off the Leaves singly, they

⁹⁴ *Aln* is 24 inches.

should be shear'd off together with their young Branches, which is much sooner done, and not so injurious to the Tree."

89. *Morus Bristolensis*, or the mulberry tree from New Bristol. I found this species of mulberry tree growing at the city of New Bristol and no other place. No one could tell me for certain if it had originated there or come from Europe. It seems to be intermediate between the black and white mulberry tree. The berries are smaller than those of the black and do not have as good a flavor; *folia cordata, sed utrinque glaberrima*. People in that community maintain that this tree produces fruit several times each summer, but this may be due to the fact that the berries ripen intermittently. *Use and care*: The same as for the one preceding.

90. *Myrica fol. lanceol. subserr. fructu baccato*.⁹⁵ Linn. *Hort. Ups.*, 295; Gale, Mill. Sp. 2. In Swedish this is called *Waxträ*. The Swedes in America call it *Talgbuske*. It grows on flat lowlands in damp, sandy soil and appears to absorb something from the salt air since it is never found far from the sea. It is a species of bog myrtle and seldom gets larger than ours. *Use*: A green wax is cooked from the berries which is used for candles, sealing wax, soap, etc. Many hundreds of pounds of wax are manufactured from the berries annually. This green wax is preferred above all other types for court-plaster. The roots are used for toothache. *Care*: The seeds are planted in pots filled with fresh sand mixed with clay. The pots are set in a hotbed which causes the plants to emerge more quickly. The pots should be moved gradually from the hotbed to the open air as early in the season as the weather will permit in order that the plants may become toughened before winter comes. They are kept in a fairly cold room during the first winter because they are still young and tender. Later they can be set in the place they are to stand. They may also be propagated from offsets which are produced in quantities. The offsets are planted in damp soil and remain there undisturbed. They may also be propagated by cuttings.

91. *Nyssa pedunculis multifloris*.⁹⁶ Gron. *Virg.*, 121. The Swedes in American call it the fish tree because the green wood smells like raw fish. It grows in forests on soil which is neither too wet nor too dry. *Use*: The grain of the wood is so twisted that it is nearly impossible to split; therefore, it is used in quantities for wheel-naves, pestles and mortars, wheels on cannon carts, etc. Birds are extremely fond of the berries, but people do not eat them. *Care*: Practically the same as that given for No. 43. However, in America the seeds are largely distributed by birds.

92. *Pepo oblongus*.⁹⁷ Mill. Sp. 1; *Cucurbita*, Linn. *Hort. Ups.*, 291, Sp. 2. The oblong pumpkin. It does not grow wild in North America but is cultivated by both Europeans and savages for food. *Use*: It is prepared for food by various methods, for example, cooking, frying, preserving, etc. The savages and French cut the meat in long thin pieces and dry it for use on long journeys. When dried it will keep for several years. *Care*: The same as that of other pumpkins.

93. *Pepo*,⁹⁸ called crookneck squash, is not wild in North America but, like the one preceding, is cultivated by both Europeans and savages. *Use*: It is used for food in exactly the same way as the preceding one and has the advantage of ripening earlier. I obtained seeds of several types, particularly a very fine one which is even rare in North

⁹⁵ *Myrica cerifera* L.

⁹⁶ *Nyssa sylvatica* Marsh.

⁹⁷ *Cucurbita Pepo* L.

⁹⁸ *Cucurbita moschata* Duchesne.

America where it is cultivated by a group of savages called the Iroquois. *Care*: The same as that of pumpkins.

94. *Persiker*, is *Amygdalus*.⁹⁹ Linn. *Hort. Ups.*, 123, Sp. 3; *Persica*, Mill. It grows wild over a large part of North America but is extensively cultivated by Europeans and savages. Some say that the one cultivated by Europeans was obtained from Europe because the fruit is larger than that of the wild one; others maintain that it is indigenous. It is now grown everywhere in the English Colonies just as we grow apple trees. However, it is often killed during the cold winters. This tree is difficult to grow in Canada. *Use*: These trees are so plentiful that pigs are fed and fatted on the fruit. The fruit is eaten while fresh or dried in the sun to be used during the winter,—just as we use pears. Small beer and a fine brandy are made from the fruit, and the bark is used as a treatment for over-eating. Both the fresh and dried fruits are very good. *Care*: The same as that ordinarily given to the peach tree, but these trees are less sensitive.

95. *Phytolacca foliis integerrimis*.¹⁰⁰ Linn. *Hort. Ups.*, 117; Gron. *Virg.*, 161; Mill. Sp. 1. It grows near houses and yards in places similar to those in which nettles and lambs quarters or *Chenopodia* are found. *Use*: A yellow dye is obtained from the root. The leaves are good for the treatment of contusions. In the spring when the leaves have just come up and while they are still tender, they are used everywhere as nettle soup, but if they are used in the same way when they are large, they are deadly poison. The sap is fairly good for cancer. *Care*: The seed is planted in a bed of good, rich, loose soil in the spring. When the plants come up they are planted 2 feet apart in a bed of rich, dry soil. After they have formed roots, they require no further care but should be kept free from weeds. They come up from the same roots for several years.

96. *Pinus foliis quinis, cortice laevi*¹⁰¹ is *Pinus*, Mill. Sp. 5, which is called white pine. It grows in places similar to those in which our pine grows but requires somewhat better soil. *Use*: It is one of the largest and tallest trees in North America. I have seen some which were 80 odd ells tall, but were not by any means the tallest. Most of the masts for English warships are made from this wood. Although this pine surpasses all other conifers in size, no tar is obtained from it. It is used for punts or dugout boats and for shingled roofs in the English Colonies because it withstands rot for quite a long time. Quantities of lumber for export are sawed from it yearly. The resin is used in treating burns. *Care*: It is planted in the same way as our pines; see last year's *Almanach*. The small plants are sheltered from the sun during the summer and should not be exposed too much to moisture, wind, or change of temperature. However, they should be watered frequently but not too heavily. When the plants are larger they can gradually be exposed to the sun.

97. *Pinus foliis ternis, squamis conorum subrotundorum aculeatis*,¹⁰² called the black pine in America. It grows under exactly the same conditions as our Swedish pine or fir. *Use*: The charcoal is considered one of the best for smiths. Much tar is distilled from the wood. *Care*: The same as that of our Swedish pine.

98. *Pinus foliis geminis, squamis conorum oblongorum aculeatis*.¹⁰³ Gron. *Virg.*, 190; *Pinus*, Mill. Sp. 18. It is called the New Jersey pine because it is particularly common in the Province of New Jersey. It is found in places similar to those in which our Swedish

⁹⁹ *Prunus Persica* (L.) Stokes.

¹⁰⁰ *Phytolacca decandra* L.

¹⁰¹ *Pinus Strobus* L.

¹⁰² *Pinus rigida* Mill.

¹⁰³ *Pinus virginiana* Mill.

pine usually grows. *Use:* Tar is distilled from the wood and lumber is sawed from it. Much charcoal is made for the use of smiths. In other words all of these American pines are used for practically the same purposes as our Swedish pines, but they do not compare with our pines in quality, for the tar is parching and injurious to rigging and rope and the wood is so full of pitch knots that it becomes wormy throughout. *Care:* The same as that of our Swedish pine.

99. *Phaseoli*, called Iroquois bean. They do not grow wild in North America but have been cultivated by the savages for food from time immemorial, long before the Europeans came to America. They are usually planted in a stand of maize and climb up the stalks of maize which act as supports for them while growing. *Use:* They are used for food in the same way as beans and peas and have been ordered all the way from North America for Versailles. A quantity of each of three different types of beans was sent home last year. *Care:* The same as that of garden peas and Turkish beans.

100. *Pisum sativum*, called Tuscarora sugar-peas. They are quite rare and do not grow wild in North America but are cultivated by a single tribe of Iroquois called Tuscarora savages. These savages formerly lived in upper Carolina, but they were constantly being drawn into war, so it was necessary for them to join that tribe of Iroquois called Oneida. The Tuscaroras carried the sugar-peas with them, and I obtained the seed in their village last summer. Only a handful was available, and most of them have already been distributed. *Use:* These peas are said to ripen twice during the summer and are as sweet as sugar. Nothing was known of them in the English and French colonies. *Care:* The same as that of other garden peas.

101. *Platanus foliis lobatis*. Linn. *Hort. Ups.*, 287; Gron. *Virg.*, 119; *Platanus occidentalis* &c., Mill. Sp. 2. This is called water beech or vase beech. It usually grows in lowlands along rivers and streams. However, it does well in any soil which is not too dry. The tree grows very rapidly and is by far the fastest growing tree in North America. It is also one of the largest trees found there. *Use:* Because of many large leaves it gives splendid shade in the summer and should be planted near houses and yards. In many places walks along the walls are made from the wood of this tree, and it is quite serviceable. This tree is planted along exposed roads. The savages make various types of vessels from the bark which is also used in treating dysentery. *Care:* The fruit of this tree resembles small balls, and each of these balls is entirely covered with seeds which float in the air when liberated. The ball should not be placed in the ground at the time of planting, but the seeds should be separated from it. The seeds are sown on a bed of good, damp, loose soil which had better be too wet than too dry. They are sown thickly because a great number do not germinate. They should be covered with mould and watered frequently but not too heavily. The beds are kept free from weeds both before and after the plants come up. This tree is difficult to grow from seed, although it is commonly propagated in nature by this method. After the plants are obtained the tree can be transplanted and propagated like willows by cuttings which are rooted in the spring.

102. *Podophyllum*.¹⁰⁴ Linn. *Hort. Ups.*, 137; Gron. *Virg.*, 57; *Anapodophyllum*, Mill. This is called swine apple by the Swedes in America. It grows in damp, black mould either in shade or under broad-leaved trees in dells which are not wet. *Use:* Some people are very fond of the fruit. The root, when taken internally, purges strongly *per superiora* & *inferiora*, and if too much of it is taken life is endangered since it is considered extremely

¹⁰⁴ *Podophyllum peltatum* L.

poisonous. *Care*: The seed is planted on the type of soil in which it grows in nature, and the plot is kept free from weeds. The plant is easily propagated by roots.

103. *Prunus sylv. Americana*,¹⁰⁵ or wild plum. Several varieties or types grow in North America. Near Albany I found trees growing wild whose plums surpassed all I have ever seen in quality and flavor. I have eaten quantities of them on several occasions without the slightest discomfort. They are so well known that seeds are not only sent to various parts of North America, but people in England have written for them. *Use and care*: The same as that of other plums.

104. *Quaks*,¹⁰⁶ the name given to a type of pumpkin which the savages have planted for food from time immemorial, long before the arrival of the Europeans. *Use*: *Quaks* have this in their favor—they grow and ripen quickly, occasionally in 2 months time—therefore, even the Europeans plant them in order to have pumpkins early. They are prepared as food in many ways just as other pumpkins. *Care*: The same as for other pumpkins.

105. *Quercus foliis superne latioribus*. Gron. *Virg.*, 117; *Quercus alba*, Banist., Mill. Sp. 9. This is called white oak in America. It grows in places similar to those in which our Swedish oak is found. *Use*: This oak in characteristics and appearance is closest to our Swedish oak. Most fences are made from it, and it makes fine wood. Of all the American oaks this is the most desirable for building houses and ships. It is also used for various kinds of cabinet work, vessels, wagon wheels, timbers, and water-wheel timbers. A quantity is sent yearly to the American islands and sugar plantations. The younger trees are used for barrel hoops. The bark is used for treating gunshot wounds, diarrhea, dysentery, and cuts. A brown dye is also obtained from it. The dry leaves are excellent for treating old sores. The acorns are good food for swine. *Care*: The seed is planted in the same way as our Swedish oak.

106. *Quercus foliorum sinubus obsusis*.¹⁰⁷ Gron. *Flor.*, 117. This is the black oak. It grows under the same conditions as the preceding one. *Use*: Nearly the same as those of the white oak, but the wood is not quite as good. Fences are made from the black oak, and a yellow dye is obtained from the bark. Timber cut from the wood is used for cabinet work of various types. Vessels and casks to keep syrup are made from it exclusively, for if they are made of white oak the syrup leaks out. The charcoal of the black oak is considered the very best for blast furnaces and iron foundries. *Care*: The same as that of other oaks.

107. *Quercus foliis obverse ovatis*.¹⁰⁸ Linn. *Hort. Cliff.*, 448; Gron. *Virg.*, 117; Mill. Sp. 8, *Castanie*. The chestnut oak. It grows here and there in the forests. *Use*: The same as those of other oaks. A red dye is obtained from the bark. *Care*: The same as that of other oaks.

108. *Quercus foliis lanceolatis integerrimis*.¹⁰⁹ Gron. *Virg.*, 117; *Quercus*, Mill. Sp. 10. This is the willow or swamp oak. It grows in wet places and swamps. *Use*: The same as for black oak. Keels of ships are often made from it. *Care*: Same as that of other oaks.

109. *Quercus*,¹¹⁰ called scrub oak. Grows in poor, dry, sandy places and never gets

¹⁰⁵ Probably *Prunus nigra* Ait.

¹⁰⁶ Probably *Cucurbita Pepo*. See L. H. Bailey, *Hortus*, 507 (New York, 1935).

¹⁰⁷ *Quercus nigra* L.

¹⁰⁸ *Quercus Prinus* L.

¹⁰⁹ *Quercus phellos* L.

¹¹⁰ *Quercus ilicifolia* Wang.

large but always remains a bush. *Use:* It is found on poor soil where nothing else will grow. *Care:* The same as that of other oaks.

In conclusion it is to be noted that, although there are 9 or more different kinds of American oaks, all of them taken together scarcely equal our Swedish oak in usefulness; ships built from American oak do not last more than 8 or at the very most 12 years before they are rotten and cannot go to sea; fences made from seasoned timber likewise will not stand over 8 or at the most 12 years before the posts are so rotted out that they are scarcely good for firewood; and houses built from any one of these oaks have practically the same fate. Therefore, we can never value our Swedish oak too highly, nor be too careful to insure its propagation. I have traveled everywhere in North America, and I know that if we take proper care of our Swedish oak, it will be worth more to us in the future than many barrels of gold; this not only is but always will be the case. I only wish we could grow more of our native oak. Also see No. 98 preceding.

110. *Rhus foliis pinnatis serratis*.¹¹¹ Linn. *Hort. Ups.*, 68; Gron. *Virg.*, 148; Mill. *Sp.* 1. It is commonly called sumac and grows in forests and on old fields in fairly loose soil which is not too dry and often becomes the worst kind of weed. *Use:* The fruit, which has an acid flavor, is sometimes eaten by children or made into vinegar. It is also used to make black ink and a red-brown dye. The roots are used in treating sores. For lack of *Sagáckhomí* (bearberry) savages and even the French mix leaves of the sumac with tobacco when they smoke. The wood is much used by tanners. *Care:* The seed is sown in fairly good, loose garden soil which is somewhat damp and is kept free from weeds. The plants must be protected from the cold the first winter while they are still tender. Later they may be treated in much the same way as willow. However, they should be planted in loose sandy soil. Subsequently they can be propagated by cuttings.

111. *Rhus foliis pinnatis integerrimis*.¹¹² Linn. *Hort. Ups.*, 68; Gron. *Virg.*, 148; *Toxicodendron*, Mill. *Sp.* 7. This is called the poisonous tree. It grows in swamps and wet places. *Use:* So far as I know this plant has no important uses, but it merits space in a corner of the garden because of its peculiar characteristics. It is considered the most poisonous tree in North America for this extraordinary reason: One person can pass by it or cut parts off and handle them without suffering any ill effects; in contrast, if another person handles the plant, both his hands and face swell very much as if he had been stung by a snake and smart as if they were burning up. Some people are so sensitive to the poison of this tree that if the smoke from the burning wood reaches them or if they only pass the place where the tree grows and the dew from the tree is carried to them by the wind they swell up as previously described. Sometimes the eyes swell shut, and they are blind for several days. I know of no one who has died from this poison, but the swelling lasts for several days and then disappears of its own accord. The greatest danger comes from burning the fresh wood in a smoking fireplace, for then, as various incidents indicate, anyone in the house is in danger of losing his life. I have carried out various experiments on myself such as rubbing the sap on both hands and face, burning the wood and smelling the smoke, and carrying the plant in my hands for half a day, and it has not hurt me in the least except when I was sweaty; then my face swelled around the eyes where there was an itching and smarting, so I had difficulty to keep from scratching. This lasted about a week. In contrast I have seen many individuals, who except for their eyes, were in such bad condition that they looked as if they had been lying in fire. I know old people who are more afraid of this tree than of rattlesnakes. This tree also grows in Japan where a

¹¹¹ *Rhus glabra* L.

¹¹² *Rhus Vernix* L.

kind of varnish is made from the sap. *Care*: Seed is sown in good, loose, damp, or wet soil which is kept free from weeds. The plot in which they are planted should be surrounded by either trees or a fence to protect it from rapid changes in temperature and from severe cold during the winter. Propagation can later be carried out by setting branches in good, wet soil and by offsets. In America these trees usually grow in shade, but occasionally they are found in open stands of broad-leaved trees.

112. *Rhus foliis ternatis; caule radicibus cortice emissis scandente*.¹¹³ *Toxicodendron*, Mill. Sp. 6. It is common in forests and climbs up trees in the same way as *Hedera* in that it fills the bark on which it climbs with roots. *Use*: This plant is of no value except as a curiosity, for the wood is quite poisonous, although not as much so as the one above. However, I have seen individuals who had scarcely been near this plant with face and hands just as badly swollen as from the poison of the one preceding. In all the experiments I tried on myself it had no effect, although I once got the sap as well as the sawdust in my eyes. If the sap is rubbed on linen or paper, it produces black spots which will not come out. *Care*: The same as for the preceding.

113. *Robinia pedunculis racemosis, foliis pinnatis*. Linn. *Hort. Ups.*, 212; Gron. *Virg.*, 82; *Pseudo-Acacia*, Mill. Sp. 1. In America this is called the locust tree. It is related to the Siberian pea tree and looks very much like it but has white flowers of a rather pleasant odor and is full of thorns. It grows here and there in forests. *Use*: This tree is planted near houses, in yards, and along roads because of its beauty. It grows to be quite large. I have seen one which was not over 6 years old and was about 3 *famnar* high.¹¹⁴ The wood is one of the hardest and is used for various purposes by carpenters. The savages formerly made their bows from it. *Care*: The seed is preferably sown in the spring on a bed of good, loose soil. When the plants come up they are kept free from weeds and watered during dry periods which greatly promotes their development. The following spring they are planted in a nursery at 18-inch intervals in rows 3 feet apart. In order to prevent the soil above the roots from drying out too quickly it is covered with turf. The upper branches of the young trees are cut off. The following spring the soil around the roots is carefully cultivated in order that they may spread easily, and all weeds are taken out. After three years in the nursery they may be finally transplanted, but they must not be subjected to sharp winds which will break their branches. During their early years they must be pampered.

114. *Sassafras*, is *Laurus fol. inf. & trilobis*.¹¹⁵ Linn. *Hort. Cliff.*, 154; Gron. *Virg.*, 46; *Cornus*, Mill. Sp. 5. Grows in good, rich, loose, sandy mould which is neither too wet nor too dry. *Use*: The flowers are used for tea, and a yellow dye is obtained from the bark. The berries are good for treating arthritis. Cows are very greedy for the young shoots, but they scarcely ever touch the mature branches. The wood is good for posts to set in the ground because it withstands rot for a long time, and the savages make bowls and vessels from it. The bark or wood is used in small beer or brandy to give a pleasant and healthful flavor, and a decoction from it is used to rinse kegs and other containers to improve the flavor of the contents and also as a treatment for gluttony. Many people have been cured of dropsy by the root, and the pits are excellent for sore eyes. *Care*: No tree is more difficult to propagate in Europe than this one, for it cannot stand either extreme heat or cold. It does not flourish, whether grown inside or outside, but dies in a

¹¹³ *Rhus Toxicodendron* L.

¹¹⁴ *Famnar* are fathoms.

¹¹⁵ *Sassafras variifolium* (Galisb) Ktze.

short time. In America it is usually propagated by birds who eat the berries. The seed is planted in good, loose, garden soil in a place where it will get the morning sun until 11 o'clock. During cold weather the mould is covered with hay, straw, or the like. The seeds come up after they have been in the ground for 1 year. In the spring, if the tree is strong enough, it is carefully transplanted into the same type of soil in which it grows in nature to a place where it will be sheltered by other trees from both cold winds and strong sunlight. The tree should not stand under the drip of other trees. The roots are covered with turf to prevent cold from going deep into the ground.

115. *Silene floribus coccineis*.¹¹⁶ Grows in loose mould. *Use*: It is planted as an ornamental in herb gardens because of its beautiful red flowers. *Care*: Sown like other flowering annuals.

116. *Smilax spinosa*.¹¹⁷ This is called greenbrier by the Swedes. It grows in rich soil in thickets. *Use*: It can be used on hedges as it is full of thorns and binds bushes together in climbing. *Care*: It is sown in loose soil under hedges or broad-leaved trees and kept free from weeds. It prefers shade.

117. *Sophora*.¹¹⁸ Linn. *Cytisus*; Gron. *Virg.*, 82. This is called wild indigo by the Swedes in America. It grows in loose, dry, fairly poor soil on pine barrens, between broad-leaved trees, or on open plains as well as on wooded hills where there is loose dry mould. *Use*: This plant has recently been found serviceable for the manufacture of a blue dye, called indigo, like the true indigo dye. Several people living in Carolina who themselves have large indigo plantations told me that they considered the dye from this plant as good as that of the true indigo or even better. The plant itself is never touched by horses or other animals. *Care*: The seed is sown in beds of fairly good, loose, dry soil in direct sunlight on southern slopes of hills which are protected from north and west storms by trees or buildings. The seeds are planted at a depth of a *fjerdedels*,¹¹⁹ or at the very most $\frac{1}{4}$ inch, as they will not come up if they are planted too deeply. The bed must be diligently weeded and carefully watered during too dry weather. The plants should be covered during the first winter in order that the tender roots will not be injured by cold. The plant dies above ground each autumn, but the root which lives from 3 to 4 years sends up new shoots each spring. It might be well to sow some seeds in open pine woods protected from the north and west winds where the soil is not too poor and there is good sunlight. However, they should not be planted directly under the pines, for it is known that few peas will grow under them.

118. *Tea bush*,¹²⁰ so-called by the Swedes in North America because many of them use it in place of tea, although there is as much difference between it and the real tea bush as between bearberry and birch. This plant grows on poor, dry, sandy places in forests between and under the trees. *Use*: It has a peculiar smell and taste much like *Filipendula vulg.* I know no herb that retains its odor as long as this one. Even when dried a few leaves will fill the air with their odor. The fruit filled with seeds is used as tea in many places. *Care*: It is sown and planted in places similar to those in which it grows in nature and is kept free from weeds.

119. *Thuja strobilis laevibus: squamis obtusis*.¹²¹ Linn. *Hort. Ups.*, 289; Mill. *Sp.* 1.

¹¹⁶ *Silene virginica* L.

¹¹⁷ *Smilax rotundifolia* L.

¹¹⁸ *Baptisia tinctoria* (L.) R. Br.

¹¹⁹ *Fjerdedels* is a quarter of any given measure or distance.

¹²⁰ *Ceanothus americanus* L.

¹²¹ *Thuja occidentalis* L.

It grows throughout Canada in places similar to those in which the fir tree grows in Sweden. *Use*: It vies with the red cedar, No. 65, in resistance to rot; therefore, in Canada it is used for all fences, pallisades surrounding forts, and timber in houses. The twigs are used for brooms. A salve is made from the leaves which is used in treating *dolores rheumaticos*. A decoction from the branches is good for treating *suppress. mens. mulier* as well as for coughs and over-eating. *Care*: It is sown and planted in the same way as fir but requires more moisture. It is difficult to grow from seed and is much easier to propagate from either offsets or branches stuck into wet ground.

120. *Thymus foliis ovatis*.¹²² Gron. *Virg.*, 64. Commonly called dittany. It grows in good, loose, dry soil among broad-leaved trees on hillsides. *Use*: It smells almost exactly like sweet marjoram and is extensively collected and used for medicine. It is used as tea in the treatment of over-eating and other sicknesses and aches. The juice is one of the surest remedies for rattlesnake bite. There is scarcely any herb growing wild in North America which the common man values as highly for medicine as this one. *Care*: It is sown and treated in much the same way as *Timian*, marjoram, and such aromatic herbs.¹²³

121. *Tilia floribus nectario instructis*.¹²⁴ Linden. Only grows in forests in good loose soil. It appears to be like the Swedish linden except that the flowers have their *nectarium*, which are *corpuscula quinque* &c., and are not described in [Linnaeus], *Gen [era] Plant[arum]*. *Use*: It is used for the same purpose as the European linden, as the savages make thread ropes and sacks from the bark; in a word, it is used in much the same way as linen and hemp. *Care*: The same as that usually given linden.

122. Watermelon with red meat is *Cucurbita foliis multipartitis*.¹²⁵ Linn. *Hort. Ups.*, 292; *Anguria*, Mill. Sp. 3, 4. They do not grow wild in North America but are cultivated both by Europeans and savages because of their delicious flavor. *Use*: They are very good to eat during the summer when it is warm as they are agreeably cool, but they are quite diuretic, so it is not advisable for women to eat much of them when they plan to row for several hours at sea. Some of these watermelons are quite large. I saw one last summer at the home of the governor of New York which weighed 47 *skålpund*. *Care*: The same as for melons or pumpkins.

123. Watermelon with white meat. These are only a variety of the one preceding. I have noticed that the further north watermelons are planted the greater the tendency to develop white meat. In contrast, the further south they are grown, the more red meat they produce. *Use and care*: The same as for the one preceding.

124. *Vicia foliis pinnatis abruptis*.¹²⁶ Gron. *Virg.*, 83. Grows in the strongest sunlight in fairly dry, loose, poor soil on pine barrens where the trees are far apart and nothing else will grow. *Use*: In sowing this plant in such barren places the soil is made useful. When the plant grows up it can be plowed under. It is generally known that plants belonging to *Diadelphia Linnaei*, or *Papilionaceae*, are readily eaten by cattle, but neither cattle nor other creatures touch this plant although it grows exuberantly. In pastures where the grass and other herbs are eaten to the ground *Vicia* remains large and luxurious. *Care*: Sown and planted like other *Viciae* or vetches and similar kinds of peas which are planted for feed. However, the type of soil must be taken into consideration.

¹²² *Cunila origanoides* (L.) Britton.

¹²³ *Timian* is *Thymus*, and *Marjoram* is Sweet Marjoram.

¹²⁴ *Tilia americana* L.

¹²⁵ *Citrullus vulgaris* Schrad.

¹²⁶ *Tephrosia virginiana* (L.) Pers.

125. *Vitis foliis palmato-angulatis*.¹²⁷ Linn. *Hort. Ups.*, 50. See Gron. *Virg.*, 24 and 144, which is the wild grape vine. From it several varieties have been obtained, all of which grow wild in North America where they often climb to the tops of the highest trees. *Use*: The fruit is not nearly as good as that of cultivated grape vines. Clusters of these wild grapes are commonly eaten particularly after they have been frosted. The grapes are used in making wine, vinegar, and brandy and when dried are used in pastries and tarts. Both green and ripe grapes are used in many ways for food. The vine is used for covering summer houses. *Care*: The seeds are sown in loose mould over a layer of gravel on the south side of a hill, mountain, or building. The plot is kept free from weeds and watered during severe droughts. When the plants come up they are given something to climb on.

126. *Holcus glumis villosis*.¹²⁸ Linn. *Hort. Ups.*, 301; *Milium*, Sp. 4 in Miller. This is African wheat. It does not grow wild in North America but has been introduced from Africa by the Negroes or slaves and is now cultivated as a curiosity. *Use*: In Africa it is the chief food of the entire realm and serves the same purpose as wheat and rye. It rarely ripens here unless it is exposed to strong sunlight, but I brought it to give to those who derive pleasure from all types of gardening. *Care*: It is sown in the spring in warm, dry soil, exposed to the sun, and kept free from weeds. I am afraid that it will be necessary to sow this plant in a hotbed at first in order to get it to ripen.

In conclusion I wish to make the following statements:

1. At the Royal Academy of Science seeds will be given free, as long as they last, to each and every person who wishes to experiment with them. Attention is called to the fact that no consignee may abuse this privilege and say or write that he has paid money for them.

2. This summer it is advisable to plant only seeds which lie in the ground a couple of years before they come up, such as chestnuts, walnuts, hazelnuts, acorns, and the like, and leave the rest until next spring or at least not plant all of each kind at one time.

3. The more sensitive and useful types should be planted in boxes, so they may be brought into the house during the winter, particularly, if they come up late in the summer or look too tender to live through the winter.

4. The rule of good gardeners should not be forgotten, that is, always give special care to useful and beautiful trees for they are delicate until established.

5. In order to gradually adapt foreign plants to our Swedish climate, remember what was discussed above under No. 51. I could give still further examples corroborating the same. I am sure that in the beginning it was just as necessary to pamper some of our more commonly cultivated plants, such as wheat, rye, barley, cabbage, turnips, etc., just as we now do peaches, Spanish chestnuts, and walnuts. Let us hope that the fruits of these useful foreign plants from southern localities will ripen here. If the same seed is carefully hoarded and planted, the plant will by degrees adapt itself to the climate. Maize in Carolina where the summers are long takes 6 whole months to ripen, just as if it instinctively knew that there was no need to grow rapidly; but the same maize in Canada takes only 3 months and sometimes less, hurrying just as if it knew the summer was short and it had no time to lose. The same is true of many other plants.

¹²⁷ *Vitis labrusca* L.

¹²⁸ *Sorghum vulgare* Pers.

SALIENT CHANGES IN SOUTHERN AGRICULTURE SINCE THE CIVIL WAR

B. I. WILEY

The first great change which came to the agriculture of the Southern States after the Civil War was initiated even before the close of hostilities.¹ This was the substitution of free labor for slavery. Many of the farmers were frankly skeptical of the Yankee-enforced free-labor system, and one Louisianian even referred to it as a scheme "in which there is a good deal of the free and but little of the labor."² Despite misgivings, however, most planters made a sincere effort to adjust themselves to the change, and agreements were drawn up with each Negro family, setting forth the conditions which were to govern labor during the ensuing crop year. At first the planters attempted to pay the freedmen wages, but the scarcity of money throughout the South soon led to the abandonment of this plan in favor of a share-crop system.³

The first efforts of employers to obtain adequate results with free labor were most discouraging. Negroes everywhere seemed bent on testing the physical reality of their emancipation. Throughout the length and breadth of the South they roamed the highways, congregated in the churches, thronged to the towns, and clustered about the Federal camps. Horses and mules were borrowed without masters' leave to transport sable participants to social gatherings where "The Brothers and Sisters of Pleasure and Prosperity" gave themselves unrestrainedly to a favorite tune:⁴

I free, I free!
I free as a frog!
I free till I fool!
Glory Alleluia!

If fresh pork was needed to enhance the joy of the occasion, there was no compunction about paying a surreptitious visit to Ole Massa's shoat pen. In fact, many of the freedmen took particular delight in robbing their erstwhile owners, referring to their pilfering as "Spilin de Gypsichuns."⁵ An Alabama planter expressed a widespread sentiment when he said that "a hog has no more chance

¹ This paper was presented at the joint luncheon of the Agricultural History Society with the American Historical Association at Chicago on Dec. 29, 1938.

² New Orleans Times, Oct. 13, 1864, p. 1.

³ Holland Thompson, "The Civil War and Social and Economic Changes," American Academy of Political and Social Science, *Annals*, 153:14 (January 1931).

⁴ W. L. Fleming, *The Sequel of Appomattox*, 275 (New Haven, 1919), refers to this Negro social organization of the Reconstruction period. The song was overheard in South Carolina during the period of transition. See E. W. A. Pringle, *Chronicles of Chicora Wood*, 273 (New York, 1922).

⁵ C. E. Merrick, *Old Times in Dixie Land*, 78 (New York, 1901).

to live among these thieving negro farmers than a June bug in a gang of puddle ducks."⁶

After a few months of willy-nilly wandering and riotous celebration, the freedmen revealed an inclination to return to the plantations of their former masters, but this settling down was more for security than for labor. Idleness continued to be the vogue. Harassed planters resorted to all sorts of devices to stimulate exertion from their sable charges, but with little avail. In 1868, a Georgia planter went so far as to advertise his willingness to give a fifty-dollar reward to anyone who would show him how to make a living with Negro labor.⁷

It was not until after the restoration of home rule in the South that agriculture began to show marked signs of recovery from freedom's demoralizing effects upon Negro labor. In 1878, the cotton crop of the South equaled that of 1860 for the first time, but in this connection, cognizance should be taken of the fact that white labor produced a much greater share of the cotton after the war than before.⁸ The recovery of sugar and tobacco was slower than that of cotton, and rice never did return to normalcy in its antebellum habitat.

A second significant change that has taken place in Southern agriculture since Appomattox is the shifting of staple crops from one locality to another. It is with reference to rice, perhaps, that this phenomenon is most striking. Before 1861, nearly all of the rice was grown in the coastal regions of South Carolina, Georgia, and Florida, but the war played havoc with the industry. Livestock were killed; farm implements were demolished; dams were destroyed; and canals and floodgates were choked with trash. Rehabilitation was retarded after the war by the demoralization of Negro labor, but by the 1880's, considerable progress had been made toward recovery. In the meantime, changes in rice cultivation had been taking place in the Southwest. Louisiana planters who had grown some rice before 1865 began to experiment with new methods of planting, cultivating, and harvesting. Early in the 1880's, farmers from the Northwest settled in Louisiana and Texas and applied wheat-growing techniques and machinery to rice culture. The use of pumps and artesian wells for flooding the fields facilitated the process of mechanization. The South Carolina and Georgia lowlands with their restricted fields and marshy soils were not as adaptable to the use of machinery as the newer area; therefore, the Southeast was forced to give way to the Southwest in the rice-growing competition. Between 1880 and 1895, Louisiana rose from third to first place among rice-producing States. During the same period South Carolina's rice crop declined one-half. Shortly before the turn of the century, a new variety of rice was introduced into the Southwest, and in the years following, there was a rapid expansion of rice cultivation in this district. In 1929, the leading rice-producing States were Louisiana, with 19 million bushels; Texas, with 7½ million bushels, and Arkansas

⁶ Fleming, *Sequel of Appomattox*, 273.

⁷ *Southern Cultivator*, 26:207 (June 1, 1868).

⁸ *The South in the Building of the Nation*, 6:15 (Richmond, 1910).

with 7 million bushels.⁹ South Carolina and Georgia still have a few rice fields, but they are maintained largely to attract transient ducks for migratory hunters. Rice, for all practical purposes, has gone with the Indians, to the land beyond the Father of Waters.

"Ole King Cotton" has also done a bit of moving about in the years that have elapsed since the Civil War. At first the general direction of shift was northward. Contributory factors were the tendency of white districts, usually the hill counties lying along the northern edge of the cotton belt, to gain in production on the more southern black districts which were handicapped by the inefficiency of free labor, and the increasing use of commercial fertilizers which hastened maturity sufficiently to open up areas hitherto closed to cotton because of the early frosts.¹⁰ Much more impressive, however, than cotton's northward shift, is its movement toward the west. Several factors entered into this movement: first, the expansive plains of Texas, Arkansas, and Oklahoma were more adaptable to large-scale cultivation by improved machinery than were the thin hills of Georgia, Alabama, and South Carolina; second, the heavy ravages of the boll weevil in the moister regions of the South, particularly in the eastern black belt, caused many cotton growers to seek the drier climate of the west; and third, the excessively high prices paid for cotton during the World War sent farmers far beyond the Mississippi in search of new lands, and even submarginal areas of the Southwest were placed in cultivation.¹¹

The composite influence of all these factors has been to give the West an ever increasing share of the Nation's cotton crop. Before the Civil War most of the cotton was grown in the Carolinas, Alabama, Georgia, and Mississippi, but now the center of production is west of the Mississippi River, Texas and Oklahoma alone producing about half of the total crop.¹² Thus has the Old South lost distinction as "the land ob cotton," and "Way Down upon the Suwanee River" is less appropriate as the caption of a cotton melody than "Far Away on the Banks of the Wichita."

Tobacco has not shown the same degree of restlessness as have rice and cotton, but the "delightful weed" has by no means confined itself to its pre-Civil War residence. In the late sixties there was a pronounced shifting of production from the older tobacco centers in Virginia and Maryland to the newer fields of Kentucky, Tennessee, and North Carolina where land was more fertile and war-damage less disastrous. By 1870, Kentucky had overcome the traditional lead of Virginia in tobacco production, and in 1890 her crop was more than that of

⁹ E. Q. Hawk, *Economic History of the South*, 469 (New York, 1934).

¹⁰ *The South in the Building of the Nation*, 6:15, 91-92. The percentage of the cotton crop produced by whites: 1860,—12; 1883,—44; 1885,—50.

¹¹ Hawk, *Economic History of the South*, 454. In 1909, 20 percent of Florida's crop acreage was devoted to cotton; in 1919, only 6 percent. There were similar decreases during this period in Southern Alabama. See U. S. Department of Agriculture, *Farmers Bulletin* 1289, p. 15-16 (Washington, 1923).

¹² Charles Johnson, E. R. Embree, and W. W. Alexander, *The Collapse of Cotton Tenancy*, 39-40 (Chapel Hill, 1935).

Virginia and Maryland combined. Kentucky continued to hold the lead in production until 1927 when she yielded first place to North Carolina. The tremendous increase of North Carolina's production is attributable largely to the growing demand by cigarette manufacturers for the bright flue-cured type which thrives on her soil. The susceptibility of twentieth-century people, especially the women, to the oleaginous importunities of modern advertisers has increased the demand for cigarette tobacco over 600 percent since 1910. To meet these enormous demands, North Carolina extended her tobacco area in all directions, but chiefly eastward and southward. South Carolina and lower Georgia were also added to the list of important producing districts. In the district around Quincy, Florida, there has been extensive development in the growing of cigar-wrapper leaf under artificial shade during the past three decades.¹³

One of the most widely discussed post-war changes in Southern agriculture has been diversification of crops. A close examination of farm statistics indicates, however, that there has been more discussion than diversification, although there have been periods when the latter was practiced to an impressive extent. It is probable that the rapid fall in the price of cotton which took place in the early seventies resulted in the abandonment of the fiber for other crops, but the shift was far from general and seemingly of comparatively short duration.¹⁴ The coming of the boll weevil in the 1900's enforced a considerable increase in diversification throughout the cotton belt, and the citizens of a southern Alabama town were so impressed by this beneficent turn of events that, in their enthusiasm, they erected a monument to the pest. "Ten years later, however, this county was cultivating almost as much cotton as before the advent of the weevil."¹⁵ Tendencies elsewhere, except in a few areas, were of a similar nature. The World War with its vigorous food-raising campaigns also gave considerable impetus to a modification of the one-crop practice, but the boom cotton prices produced by the conflict ultimately defeated the movement toward diversification.

The most recent diversifying stimulus has been the cotton-reduction program sponsored by the Federal Government. Official reports indicate that there has probably been more diversification since 1933 than during any preceding period in the history of the South. In 1934 and 1935 about 14 million acres normally in cotton were shifted to the production of other crops; and in 1936 the diverted acreage was the largest on record.¹⁶ Whether or not this government-inspired reform is to have lasting effects remains to be seen; but unless Uncle Sam proves more persistent than the boll weevil, the results are destined to be ephemeral.

¹³ *The South in the Building of the Nation*, 6:66; Hawk, *Economic History of the South*, 462-463. For data on the leading centers of tobacco production in the United States by State and by type, see U. S. Department of Agriculture, *Yearbook*, 1922, p. 401-410.

¹⁴ E. E. Edwards, "Historical Background of the Present Situation in Southern Agriculture," Southern Economic Association, *Proceedings* (1930), 3:78-93.

¹⁵ T. J. Woofert, "Landlord and Tenant on the Cotton Plantation," Works Progress Administration, Division of Social Research, *Research Monograph* 5, p. 47 (Washington, 1936).

¹⁶ *Ibid.*, 48; U. S. Department of Agriculture, *Yearbook*, 1937, p. 14.

Mention should also be made of certain marked changes in crops that have been made in specific localities during the period under study. Since 1872, when the first refrigerator carload of strawberries reached Chicago from the lower Mississippi Valley, there has been a substantial increase of fruit growing and truck farming in various parts of the South Central States.¹⁷ Along the South Atlantic seaboard there have been similar developments. Fast trains transport ice-cooled produce from the latter district to northeastern markets with phenomenal dispatch, even passenger traffic yielding the right-of-way on occasion to fruit and vegetables. Not so long ago a trainload of eastern millionaires en route to Palm Beach was run off on a siding to permit the passing of a north-bound train of southern cabbages.¹⁸ In 1929, the value of the South's truck crop was almost half that of the entire Nation.¹⁹

Florida has become the chief grapefruit-producing State, and in oranges she is outranked only by California. Virginia produces more apples for sale than any other State; Georgia grows more peaches than any State except California; and Arkansas and Missouri ordinarily produce over 25 million tons of grapes annually.²⁰

Since the outbreak of the World War, dairying has become a considerable factor, notably in Kentucky, Georgia, Arkansas, and Mississippi. Yet only 68 percent of the farms in the South had milch cows in 1925. In certain periods and areas there have been marked increases in corn and livestock production. The same is true of some of the grasses and smaller cereals. The growth of legumes increased considerably between 1920 and 1930, but even in 1931 less than 5 percent of the crop lands of the South were devoted to them. On the whole, the volume of production of these items remains insignificant. After cognizance has been taken of all periodic and sectional departures from one-crop systems, the fact stands out in regrettably bold relief that Southern agriculture is, for the most part, woefully lacking in diversification.²¹

¹⁷ *The South in the Building of the Nation*, 6:130.

¹⁸ R. B. Vance, *Human Geography of the South*, 225 (Chapel Hill, 1935).

¹⁹ Hawk, *Economic History of the South*, 465; O. E. Baker and A. B. Genung, "A Graphic Summary of Farm Crops," U. S. Department of Agriculture, *Miscellaneous Publication 267*, p. 94 (Washington, 1938).

²⁰ Hawk, *Economic History of the South*, 465.

²¹ *Ibid.*, 471; R. G. Bressler, Jr., and J. A. Hopkins, "Trends in Size and Production of Aggregate Farm Enterprise, 1909-1936," Works Progress Administration, National Research Project, *Report A-6*, p. 64 (Philadelphia, 1938); Woofter, "Landlord and Tenant on the Cotton Plantation," 47; Vance, *Human Geography of the South*, 170; D. L. Wickens, "Adjusting Southern Agriculture to Economic Changes," *American Academy of Political and Social Science, Annals*, 153:195-196 (January 1931); A. E. Parkins, *The South: Its Economic-Geographic Development*, 264 (New York, 1938). Dairy development in Mississippi has been more striking than in any other State in the Cotton Belt. In 1909 the State sold only 3,334 pounds of butter; in 1918 it sold nearly 2 million pounds, and by 1927 it sold over 8 million pounds. In 1912 there was only one creamery in the State; by 1923 the output of her creameries was greater than the combined output of the States of Virginia, North Carolina, South Carolina, Georgia, and Florida. In 1927 two Armour creameries in the State turned out 2½ million pounds of butter.

Another change in Southern agriculture which has occasioned a vast amount of discussion is the substitution of machinery for hand labor in the various farm processes. The most extensive application of machinery to cotton culture has been in the Arkansas-Mississippi Delta and in Texas where broad expanses of level land have conduced to large-scale enterprise. In these favored areas the post-Civil War years have seen the introduction of many labor-saving devices. The ground is broken with gang plows of two or more bottoms, or with vertical disks; planting is done two and four rows at a time; the growing crop is plowed with multi-row cultivators; and, since 1914, tractors have been used to an increasing extent by large-scale growers. At first tractors were used almost solely for soil preparation and planting, but with the introduction of the lighter, higher-built, all-purpose machine in the 1920's, they came into general use for cultivation. With this development the mule and the horse ceased to be essential to the production of cotton, and to a considerable extent they have been replaced. In two Mississippi Delta counties the number of farmers using tractors increased from 5 to 45 percent between 1919 and 1936, and there were similar increases in several Texas counties. The number of tractors in use in Mississippi increased 730 percent between 1919 and 1929. In Texas, the percentage of increase was not as great; but the Lone Star State in 1929 outranked Mississippi and all other cotton States in number of tractors in use. Many of the larger plantations use more than one tractor. A Works Progress Administration research group found this to be true of 6 percent of the farms in the Mississippi Delta section in 1929, and 12 percent in 1936. In three western counties the percent of farms using two or more tractors was 2 percent in 1929, and 4 percent in 1936. The traveller in Texas or the Mississippi Delta will occasionally see two machines side by side in the same field, each pulling a four-row cultivator.²²

In recent years the boll weevil has brought a machine of an unusual sort, an implement hitherto far removed from cotton culture, to the Mississippi Delta. This innovation is the airplane. It is used to blanket the expansive cotton fields with death-dealing, boll-weevil dust, and, much to the Negroes' delight, it has proved its effectiveness and practicability in the control of the cotton pest.²³

In descanting upon the mechanical marvels on the large plantations, one should not overlook the fact that labor-saving machinery has made little headway in that portion of the cotton belt which lies east of the Mississippi River and outside the Delta district. In this vast stretch of agricultural land, the farm implements in general use do not differ greatly from those of antebellum times. Estimates based on a recent survey indicate that 40 percent of all the plows used in this area were the one-bottom, one-horse type. The typical farmer beds up his cotton ground with a one-horse, turning plow, or with a middle-buster, and

²² W. C. Holley and L. E. Arnold, "Changes in Technology and Labor Requirements in Crop Production," Works Progress Administration, National Research Project, *Report A-7*, p. 58-59 (Philadelphia, 1938); U. S. Department of Agriculture, *Yearbook*, 1932, p. 430.

²³ Harris Dickson, *The Story of King Cotton*, 101-103 (New York, 1937).

plants with a one-row planter. Comparatively few use disks in preparing the fields. Four out of five farmers use half-row implements for cultivation purposes. Only about 1 percent of the plows in this area are drawn by tractors, and less than 2½ percent of the farms use tractors for any purpose.²⁴

In all parts of the cotton belt there has been much discussion of the need of mechanical devices for picking cotton. As early as 1850 a patent was issued for a mechanical cotton harvester. Since 1865, patents have been issued every year except 1899, and the aggregate number granted now exceeds nine hundred. Every one of the patentees has had high hopes for the success of his device, and in recent decades the expectations of people in general have been stimulated repeatedly by the fanfare of publicity. It is amusing in looking over the section of periodical guides captioned "Cotton Picking Machines" for the early 1900's, to observe the repetition of articles entitled "Cotton Picking Machine at Last." In very recent years several patentees, particularly the Rust Brothers and the International Harvester Company, have elicited considerable favorable publicity by demonstrations of their machines, but as yet, mechanical cotton picking is still in the experimental stage. In view of the many difficulties still unsolved and of the traditional evaporation of such devices in press ballyhoo, lingering skepticism as to the imminent application of mechanical cotton pickers to general use is justifiable. Except in restricted portions of the Southwest where harvesting is accomplished by sled-like contraptions which strip all the bolls from the stalk and by hand-snatching open bolls from the plants, cotton picking remains on the same status today as in pre-Civil War times.²⁵

Rice cultivation, since its migration from the older South to the level lands in the Southwest, has been mechanized to a much greater extent than cotton. The reapers, threshers, and other implements which the wheat farmers introduced when they came to the rice country in the 1880's were gradually improved as time progressed; in the main, the mechanistic changes paralleled those made in the wheat regions, the tendency being toward larger and more powerful units.

While sugar-cane growers have not mechanized their farms to an extent anywhere near that of the rice planters, many improvements have been made in this industry. Among new implements introduced since the Civil War are extra large plows, high double cultivators, stubble shavers, stubble diggers, and, on some plantations, mechanical loaders. The hand tools used for stripping and cutting cane have also been improved, and special hoisting appliances have been introduced by some farmers to pull seed cane from windrows. Tractors

²⁴ Holley and Arnold, "Changes in Technology and Labor Requirements in Crop Production," 19-54; O. E. Baker, "A Graphic Summary of Farm Machinery, Facilities, Roads, and Expenditures," U. S. Department of Agriculture, *Miscellaneous Publication 264*, p. 7 (Washington, 1937).

²⁵ This summary is based largely on the following sources: R. L. Horne and Eugene McKibben, "Mechanical Cotton Picker," Works Progress Administration, *Studies of Changing Techniques and Employment in Agriculture, Report A-2*, p. 5-22 (Philadelphia, 1937); Holley and Arnold, "Changes in Technology and Labor Requirements in Cotton Production," 61-63; Dickson, *Story of King Cotton*, 175-188; F. D. McHugh, "Machines Pick Cotton But—," *Scientific American*, 150:242-245 (November 1938).

have replaced mules for the heavier operations on a few plantations, but, as yet, there has been no extensive use of this type of power in cane areas.²⁶ In recent years efforts have been made to perfect a mechanical device for cutting cane. A cutting machine demonstrated in Louisiana last October elicited enthusiastic comment from the press,²⁷ but the general practicability of this and all other mechanical harvesting contraptions is yet to be established.

Mechanization of tobacco cultivation has made little progress since the Civil War. On some farms tractors have been introduced for soil preparation, but on the whole their use is not extensive. In the cigar-leaf and burley districts mechanical devices are rather widely used for transplanting tobacco plants from bed to field, and with good results.²⁸

In recent decades, Southern corn growers have made use of gang plows, disks, multi-row planters, and single- or double-row cultivators. A few use tractors. Of the machines for cutting and husking corn which have come into use in the Middle West, the Southern farmer has no direct knowledge. The same might be said of mechanical potato diggers, if portions of Texas be excepted. Nor have recent improvements for harvesting hay and small grains been utilized to any considerable extent in the South. Occasionally one hears of mechanical milkers in Southern dairies, but their use is not widespread. Southern poultry men have made extensive use of artificial incubation and brooding; but such practices as electrically illuminating laying houses to stimulate egg production are regarded by Southerners generally as "new fangled," "Yankee" impracticalities.

One device which has wide use in the South is the small motor-truck. The automobile also comes in for a surprising number of tasks commonly performed by trucks in more prosperous parts of the country.²⁹ The "family flivver" is used to haul everything ranging from fresh beans to chicken feed, and from mule colts to field hands. But granting an extensive use of motor vehicles on Southern farms, the Census of 1930 showed that the South ranked far below other sections of the country in per capita ownership of both automobiles and trucks.³⁰ In fact, there is apparently no phase of farm mechanization in which the South does not lag far behind the national average. In innumerable instances the acquaintance of the Southern farmer with post-Civil War improvements in farm machinery does not transcend the illustrations of Government bulletins, "Yankee" periodicals, and Sears Roebuck catalogs.

The years since the Civil War have seen marked changes in farm tenure in the South. It is true that there have been no great modifications in the types of

²⁶ U. S. Department of Agriculture, *Yearbook*, 1923, p. 171-172; 1932, p. 428.

²⁷ *Time*, 32:50 (Oct. 10, 1938).

²⁸ U. S. Department of Agriculture, *Yearbook*, 1922, p. 417.

²⁹ The automobile has not attained the utility predicted for it in the early 1900's. At that time the *Scientific American* included such titles as "Automobile Hoe," "Automobile Plow," "Automobile as a Plowhorse," "Automobile Cultivator," "Automobile Mower," "Automobile Mowing Machine." See *Readers Guide to Periodical Literature* for 1901-1909.

³⁰ Baker, "Graphic Summary of Farm Machinery, Facilities, Roads, and Expenditures," 3-6.

tenantry as developed during Reconstruction.³¹ The "on-halves" plan, now generally called the "cropper" system, and the "standing rent" scheme are essentially the same today as when first introduced. The "third and fourth" system which originally indicated that the tenant received either a third or a fourth of the crop, depending on whether or not he furnished his own family supplies, now provides that the tenant is to furnish implements and power as well as supplies, and that the planter is to receive a third of the cotton and a fourth of the corn; but this modification came before the turn of the century.³² The great change since Reconstruction has been not in the types of tenantry but in the number, distribution, and character of tenures.

One of the most striking phenomena of the South's post-Civil War history has been the marked increase in the number of farm tenants. In 1880, 36 percent of the farms of the South were operated by tenants. By 1900, the percent of tenant-operated farms had climbed to 47. During the first decade of the present century, there was a further increase of tenantry, but in most sections it was small in comparison with the previous ten-year period. Census figures show that about 50 percent of the Southern farms were tenant-operated in 1910. The next decade saw substantial increases on the South Atlantic seaboard and in the Mississippi Delta. Labor for the enlarged enterprises in both these sections was provided largely by tenants many of whom had migrated from communities ravaged by the boll weevil. The areas suffering most from the boll weevil had a decrease in tenantry during this period, due to abandonment or consolidation of farm holdings. For the South as a whole, the change was inconsiderable. In the 1920's the percent of tenancy reached the unprecedented figure of 56. The increase was most pronounced in fertile, large-plantation areas, where farmers had learned to grow cotton profitably despite the presence of the boll weevil. In Texas, during this decade, the percent of tenant-operated farms rose from 53 to 61; in Arkansas, from 51 to 63; and in Mississippi, from 66 to 72. This figure of 72, attained by Mississippi in 1930, apparently marks the highest percentage of farms operated by tenants ever reached by a State in the entire history of this country. The twenties also saw a pronounced increase in tenantry in the northern part of the cotton belt and in eastern portions of the tobacco country.³³

From 1930 to 1935 there was a general decrease of tenancy in the South. Several factors contributed to this reversal of a trend which had been operative for over half a century. Outstanding among these was the widespread abandonment of tenant holdings because of the extremely low prices of farm commodities brought by the great depression. Pertinent also was the disruptive effect of the crop reduction program inaugurated by the AAA. The withdrawal

³¹ Thompson, "The Civil War and Social and Economic Changes," 14-16, gives a good discussion of modifications of the tenant system between 1865 and 1880.

³² *The South in the Building of the Nation*, 6:6.

³³ H. A. Turner, "A Graphic Summary of Farm Tenure," U. S. Department of Agriculture, *Miscellaneous Publication 261*, p. 15, 21, 23 (Washington, 1936). In this survey sixteen States are grouped as Southern.

of several million acres from cultivation and the shift of other millions of acres from soil-depleting to soil-building crops requiring less intense cultivation naturally meant the displacement of great numbers of tenants. The benefit payments and other aspects of the AAA program caused a substitution of wage compensation for tenantry in a considerable number of instances. Many tenants displaced by the recovery program went on relief; some were able to earn a livelihood as farm laborers; and a number abandoned the farm for city and town. These and other trends of recent years have caused many publicists to predict the impending collapse of the tenant system. Granting the seriousness of many aspects of the situation, the comparatively small decrease from 56 to 54 percent in the number of Southern farms operated by tenants from 1930 to 1935 gives little basis for belief in the system's imminent exit.

A very interesting phase of the change in Southern land tenure is the increasing proportion of whites among tenant farmers. Between 1920 and 1935, the number of white tenants in the South increased 35 percent. During the same period colored tenants decreased 11 percent, their numerical decrease being 74,000. The white tenants of the South now outnumber Negro tenants two to one. It is significant that the tenant problem in the South is becoming increasingly a question involving whites.

There has been a considerable increase in recent years in the percentage of "croppers" among Negro tenants. In 1920, 47 percent of the colored tenants were farming "on halves." In 1925, the percent had increased to 54, and in 1935, 59 out of every 100 colored tenant farmers were "croppers." This marked increase in the proportion of "croppers" among Negro tenants did not have a parallel among the whites. Throughout the fifteen-year period preceding 1935, the percent of white tenants who were croppers remained almost stationary at about 29. This lowering of status from renter to "cropper" gives significant weight to the already impressive evidence that the Negro is steadily losing ground to the white in the general pattern of Southern agriculture. The percentage of Southern farmers who were colored tenants and "croppers" decreased from 21.7 in 1930 to 18.4 in 1935.³⁴

The development of cooperative marketing organizations should be included among the changes which Southern agriculture has undergone since the Civil War. Cooperatives, in the South, as elsewhere, generally had their original inspiration in the Granger movement of the 1870's. However, the Grange-sponsored marketing organizations had only brief existence. In the past fifty years there have been recurrent waves of cooperative activity among Southern farmers, but the careers of the resulting organizations have generally been ephemeral. In 1925, the South had only 1,094, or 10 percent, of the Nation's farmer cooperatives. Most of these associations had come into existence since 1915, and the great majority of them were small organizations with only local connections. Since 1920 there has been a tendency toward consolidation and

³⁴ Turner, "Graphic Summary of Farm Tenure," 2-3, 15, 25, 27, 30. See also Woofter, "Landlord and Tenant on the Cotton Plantation," xxi-xxii; and Vance, *Human Geography of the South*, 187.

incorporation among Southern cooperatives, especially among those handling cotton, tobacco, and citrus fruit.³⁵ Outside these large-scale organizations cooperative marketing enterprises in the South have been comparatively inconsequential. The Federal Government has, in recent years, given much encouragement to the cooperative movement, but the permanent results of Uncle Sam's assistance remain to be seen.

Any discussion of post-Civil War Southern agriculture would be incomplete without mention being made of notable changes which the character of farm life has undergone in recent decades. Outstanding among these is the breaking down of rural isolation by motorized transportation, telephones, and radios. Increased contact with cities and towns has in turn led to modifications in food, dress, manners, and speech. Even in remote districts, many farmers have daily papers delivered to their doors by special carriers only a few hours after they come from the press. In some localities traveling libraries make regular rounds through rural communities with books for children and adults. These and other facilities which the twentieth century has introduced have closed the gap between town and country life to a considerable degree.

Closer contact of country people with towns has produced many other changes. Quiltings and sewing circles have given way to bridge parties and book clubs. Country churches have yielded considerable portions of their membership to town congregations. Rural revival meetings have lost much of their shouting character, and country parsons much of their hell-fire harangue. Methodist quarterly meetings which formerly were occasions for huge assemblages with the community's choice cooking served as dinner on the grounds have become sedate, sparsely attended, foodless functions. Crossroads stores, erstwhile discussion centers for subjects varying from infant baptism to the national debt and community marts for wares ranging from milady's nerve tonic to plow-horse belly-bands, have long since given way to the more pretentious mercantile establishments of the county seat or metropolis. More and more, country boys of "courting" age are insisting that their trousers be creased with the town steam-presser instead of the household iron, and that their hair be trimmed with electric clippers rather than the family shears. Rural men who marry are showing an increasing tendency toward the metropolite's distaste for large families and his penchant for the divorce court.³⁶

There is a happier side to the changes which recent decades have brought to rural life in the South. The improvement of household facilities has enhanced

³⁵ R. H. Ellsworth, "Agricultural Cooperative Associations," U. S. Department of Agriculture, *Technical Bulletin* 40, p. 5-7, 22, 33, 61-62 (Washington, 1928). Fifteen of the 121 cotton cooperatives in 1925 were large-scale organizations handling an aggregate of over a million bales annually, and of the 24 tobacco marketing cooperatives listed by the U. S. Department of Agriculture in 1925, 7 were large-scale organizations with an aggregate membership of 298,000 and an annual output of nearly one-half billion pounds of tobacco. However, the tobacco handled by cooperatives declined after 1922, and several of the associations, including those of Virginia and North Carolina, have gone out of business.

³⁶ T. C. McCormick, "Major Trends in Rural Life in the United States," *American Journal of Sociology*, 36:721-734 (March 1931).

the comfort and reduced the labor of innumerable homes. Gasoline engines perform a wide variety of services ranging from sawing wood to shelling corn. Electricity provides motor power for water pumps, mechanical milkers, sewing machines, vacuum cleaners, and washing machines; it furnishes heat for ovens, toasters, grills, hair curlers, and smoothing irons, and general illumination for house and barn. A plumbing system carries hot and cold water to kitchen and bathroom. Countless other gadgets about the house and farm accentuate the comfort and mitigate the burden of rural life in general.³⁷

The regrettable thing about this roseate picture of modernized farm life is the very limited extent to which it has been realized in the South. The story of household facilities is about the same as that of farm machinery. Comparatively few Southern people have been able to avail themselves of mechanical improvements. Less than 3 percent of Southern farms had stationary gas engines in 1930, as compared with 15 percent for the Nation as a whole. Only 1 percent of the farms of Louisiana, Mississippi, Alabama, and South Carolina, and 2 percent of the farms of Georgia had stationary gas engines. Considerably less than 1 percent of the Southern farms had electric motors, as against 4 percent for the entire country. For the United States as a whole, 1 farm out of every 7 had electric lights, the ratio for the South being 1 out of every 20, and for Mississippi, only 1 out of every 50. Less than 4 farms out of every 100 in the Southern cotton belt east of Texas had running water piped into the dwellings, as compared with the national ratio of 17 to every 100; only one-half of the Southern farm dwellings that had running water were equipped with bathrooms. While 1 out of every 3 farmers in the country as a whole had a telephone, the ratio in the South was less than 1 out of 10; in Mississippi it was 1 out of 20, and in Louisiana, 1 out of 25.³⁸

A casual glance at these and other comparative statistics suffices to convince even the most skeptical that the South lags far behind all other sections in the utilization of improved farm facilities. The same holds true generally of diversification, landownership, soil conservation, and other measures of agricultural progress. Indeed, the most pronounced changes which have taken place in Southern agriculture since the Civil War are the shift of crops from one locality to another and the substitution of free labor for slavery. The latter was a war-enforced measure; the former was caused by a great variety of factors. Neither has any appreciable connection with conscious progress. When all the modifications which have taken place in Southern agriculture since 1865 are considered in comparison with those of other parts of the country, the striking thing is not the vastness but the meagerness of change.

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³⁷ "Ninety Years of Farm Progress," *Southern Planter*, 91(4):13 (Feb. 15, 1930).

³⁸ Baker, "Graphic Summary of Farm Machinery, Facilities, Roads, and Expenditures," 9, 10, 12, 14-16.

THE COOPERATIVE MOVEMENT IN THE OREGON APPLE INDUSTRY, 1910-1929

JOSEPH WALDO ELLISON

The greater part of the apple acreage in the Pacific Northwest was set out between 1900 and 1912.¹ During this period a large number of easterners, lured by the scenery, the climate, and the reports of possible profits from apple culture, came to the Northwest to plant orchards. A veritable apple boom took place between 1906 and 1912, especially in the Umpqua and Willamette valleys. Although no reliable statistics of the acreage planted during this period are available, the estimates run from 250,000 to 500,000 acres. So great was the demand for Northwestern apples that in localities like the Hood River Valley the buyers arrived in July and August and placed their bids in sealed envelopes which were opened at the local banks. The crop usually went to the highest bidder. It is not surprising that the apple growers of the Northwest became confident that their fruit was unexcelled in size, color, and quality and would always be in great demand. They laughed at those who expressed the possibility of overproduction and advised caution.²

Even during this period of prosperity, many fruit growers felt the need for local organization. The first fruit-growers union in the Pacific Northwest was organized in 1892 to care for the strawberries of the Hood River Valley. This was followed by an organization which handled apples, and the two were eventually consolidated to form the Hood River Apple Growers' Association. Since the growing of apples was confined to an area 5 by 15 miles in extent, it was easy to organize the farmers. By 1907, the Association had one hundred members and controlled 90 percent of the fruit of the Valley. It became the best organized district in the Northwest,³ and through extensive advertising, its Diamond Brand became known throughout the country as a high-quality apple. Other local associations of fruit growers were soon organized in the Northwest, including the Mosier Association in Oregon, and the Yakima Fruit Growers' Association, now known as the "Big Y," in Washington. By 1910 there were twenty-

¹ For the early history of the subject, see J. W. Ellison, "The Beginnings of the Apple Industry in Oregon," *Agricultural History*, 11:322-343 (October 1937).

² C. I. Lewis, "Cooperation in the Pacific Northwest," *American Fruit Grower*, 41(2):7 (February 1921).

³ C. L. Gatlin, "Confidential Files." In 1934, with a membership of five hundred, the Hood River Apple Growers' Association marketed over 1,600,000 boxes and crates of apples, strawberries, and cherries in the United States, Europe, and South America. In 1935, it borrowed \$420,000 from the Bank for Cooperatives at Spokane to liquidate the \$150,000 due on an original loan and provide capital for the construction of cold storage and warehouse facilities. See *Better Fruit*, 30(1):4 (July 1935).

See also S. M. Thomson and G. H. Miller, "The Cost of Producing Apples in Hood River Valley," U. S. Department of Agriculture, *Bulletin 518* (Washington, 1917); R. G. McNary, "Cooperative Marketing Success," *Oregon Grower*, 4(2):5, 19 (September 1922).

five fruit associations in Oregon and about as many in Washington.⁴ These associations performed valuable service, not only to their members, but to the entire apple industry of the Northwest. They purchased material more cheaply, built desirable cold storage and suitable packing plants, standardized the local pack, bargained with the railroads, reduced to some extent the cost of marketing, and encouraged better production. In the opinion of one of the early organizers, they were the bulwark of the Northwest apple industry; without their support, it might never have developed to a high degree.⁵

In 1910, however, dark clouds began to appear on the horizon. The apple market began to waver, and the losses on Northwestern apples made buyers cautious the following year. Quantity shipments to several eastern cities glutted the markets, resulting in lower prices. Many cried that the failure of the market was due to overproduction; others were convinced that the solution of the problem lay in more intelligent marketing, with wider and more economical distribution.⁶ The latter group believed that the individual small-scale producer was greatly handicapped in the modern economic system, and that even a small association could not cope with the great problem confronting the industry. It could not secure necessary legislation or deal advantageously with the Interstate Commerce Commission concerning freight rates, nor could it accomplish much in improving the marketing system by preventing gluts and reducing the cost of distribution by eliminating retail waste and graft. On the other hand, a large cooperative organization formed along State or sectional lines could be an effective force and the salvation of the apple industry. It could buy in carload lots and sell boxes, sprays, paper, and other necessary supplies at wholesale to its members.⁷ It could also engage specially trained men to watch the markets and dispose of the fruit to the best advantage and to shorten the steps between the producer and the consumer for the benefit of both.

With the success of the California cooperatives serving as an inspiration, Northwestern fruit growers began to consider plans to emulate the California experiments, particularly the California Fruit Growers' Exchange.⁸ At the

⁴ Among those listed in *Better Fruit*, 5(4):72 (October 1910) are: Hood River Apple Growers' Union, Grand Ronde Valley Fruit Growers Union, Rogue River Fruit and Produce Association, Eugene Fruit Growers Association, Ashland Fruit and Produce Association, Milton Fruit Growers' Union, Mosier Fruit Growers' Union, Coos Bay Fruit Growers' Association, Wenatchee Fruit Growers' Union, and Yakima Valley Fruit and Produce Growers' Association.

⁵ Lewis, "Cooperation in the Pacific Northwest," 7.

⁶ *Ibid.*

⁷ Many of the California Fruit cooperatives owned their own timber, operated their own lumber camps, and manufactured their own boxes.

⁸ Oregon State Horticultural Society, *Annual Report*, 1911, p. 22, 62; and C. I. Lewis, "Cooperation and the Fruit Industry," *American Fruit Grower*, 40(12):4, 17, 20 (December 1920). For the history, structure, and functions of the California Fruit Growers Exchange, see W. W. Cumberland, *Cooperative Marketing* (Princeton, N. J., 1917); R. M. MacCurdy, *The History of the California Fruit Growers Exchange* (Los Angeles, 1925); and H. E. Erdman, *The California Fruit Growers Exchange* (New York, 1933).

Spokane apple show in November 1910 the marketing problem was discussed at a meeting of some four hundred representatives from the various fruit districts of the Northwest. It was agreed that a conference of growers should be summoned to discuss definite plans for a new marketing system. In his presidential address to the Oregon State Horticultural Society in 1910, Homer C. Atwell reviewed fully the scope and methods of the California Fruit Growers' Exchange and urged strongly the formation of a similar organization to handle the apple crops of the Northwest. "Is there any peculiarity in climate of California that makes such business organization impossible to apple-growers of Pacific Northwest?" he asked.⁹

The Oregon State Horticultural Society instructed its president to call a convention of fruit growers and associations to meet in Portland on January 24, 1911 "to consider the organization of a fruitgrowers' central selling agency."¹⁰ The meeting was attended by delegations from the three Northwestern States, and the plan for a central agency was fully discussed. The resolutions asserted that such an organization would be of vital importance to the growers of the Northwest and recommended that organizations be formed in all localities where practicable, and that they unite to form district associations. These, in turn, were to elect delegates who were to form a central organization for all the district associations of the Northwest, "to formulate rules and regulations for securing a uniform grade and pack of fruit to be shipped, and to act as a general sales agency through which the fruit of the members of the local association shall be marketed and distributed." It was further recommended that the associations already in existence send delegates to a meeting to be held for this purpose at Walla Walla in February 1911. In the meantime, the fruit growers of Washington had held their seventh annual convention at Prosser on January 17, with representatives from Oregon also attending. This was one of the largest conventions ever held in the Northwest.

At the Walla Walla meetings on February 28 and March 1, 1911, a plan was adopted for submission to the various local fruit-growers associations which was identical with that of the California Fruit Growers Exchange and in accordance with the suggestions made some years before by Secretary of Agriculture James Wilson. The purpose of the plan, according to its sponsors, was to put the orchard industry of the Northwest on a sound basis by arranging for a growers' organization to handle the products directly instead of "taking the blind chances of delegating the distribution to produce speculators," to systematize and integrate distribution, and to prevent the glutting of markets which threatened to ruin the industry. The plan recommended that all fruit localities form associations similar to those already in existence to control the details of growing and assembling products for market. These were to employ and control all

⁹ Oregon State Horticultural Society, Twenty-fifth Annual Meeting, *Proceedings and Papers*, 1910, p. 16-17.

¹⁰ The quotations and data are from the Oregon State Horticultural Society, *Annual Report*, 1911, p. 61-65.

needed help and provide packing houses and warehouses. To meet expenses, they were to make a handling charge per package on all products. When ready for shipment, the products were to be turned over to district associations which were to control the grading and packing by sending out inspectors to supervise the work. The operating expenses of these associations were to be met by a commission charge on the products handled. Representatives from each district were to constitute a board of directors for the central exchange, which was to have the exclusive sale of all fruit controlled by the district associations holding membership in the central organization. It was to establish a sales system covering all markets where the fruit could be sold. It was to be well equipped with competent traffic experts and a sales manager. It was to maintain an efficient system of market and crop reports. It was to eliminate unnecessary expenses. It was to carry on an extensive publicity campaign similar to that of the California orange growers to increase the demand for the fruit of the Northwest. While the central exchange was to have rules for maintaining uniform grades and packs, the districts were not to lose their identity. The product of each was to be marketed on its own merits in a proportionate share, but the trade mark of the central exchange was to appear on each package.

After discussion and adoption of the plan, an executive committee of eleven, representing the eleven natural geographical districts of the Northwest, was chosen and instructed to present it to the various local fruit-growers associations. They were requested to report their acceptance of the plan as soon as possible. Those objecting were to propose such amendments "as will make it satisfactory in its present form." The committee was further instructed, upon receipt of the answers from the local associations, to adjust differences, prepare a preliminary draft of a constitution for a central selling exchange, and submit it to another convention of the fruit-growers associations.¹¹

This ambitious plan encountered opposition from many growers of the Northwest. Some feared that the new organization would operate in restraint of trade and would thus be a violation of the Sherman Anti-Trust Act. The advocates, however, maintained that the central agency would merely seek to do away with much of the speculative uncertainty and that, by eliminating the middleman, both producer and consumer would benefit. Some of the associations feared that the "prestige of their output would be injured by going in with the growers of common apples," and that they would thus be deprived of the benefits of the markets which they had already successfully established. This objection, however, was met by the provision that the fruit of one district was not to be pooled with that of another. Each local association was to manage its own pooling policies and establish its own brands. It was pointed out that under the California system the various local associations packed nearly two hundred different brands. Each local group was free to regulate and control the shipments of its fruit and to determine the price. As to the objec-

¹¹ *Better Fruit* for 1910-11, especially 5(6):44, (8):48, 55-56, (10):48, 51 (December 1910, February, April 1911).

tion that the new organization would embrace too much territory, it was emphasized that the leading fruit districts in the Northwest were no more widespread than the orange-producing centers of California.¹²

According to the editor of *Better Fruit*, the strongest argument against the new organization was voiced by the *Yakima Republic* which maintained that such an ambitious plan had no chance to succeed. "Why talk about organizing the fruit men of three states," it asked, "when we have not organized any district, when we have not formed a working association in any single valley or neighborhood."¹³ According to both these publications, the initial need was local district associations similar to those in the Hood River and Wenatchee valleys. Only after such organizations had been successfully established could a central agency succeed. The advocates admitted that their plan would encounter many complex problems, but no more than those confronting the hundred existing independent sellers. Such an organization was successful in California and in harmony with the general trend throughout the country.

During the summer and fall of 1911, the fruit growers of the Northwest discussed the plan. Wenatchee finally voted not to join the central selling agency, and the Hood River Apple Growers' Union did not even bring it up for discussion at its annual meeting. The Southern Oregon District Association decided to market its apples through the Northwestern Fruit Exchange.¹⁴

The committee of eleven, however, met at Spokane on November 27, 1911 and reported that, according to the opinions of most growers associations, the plan was fundamentally sound, a vital necessity, and worthy of eventual adoption. It made a number of recommendations to lay the foundation for a central marketing agency and outlined the fundamental principles for an exchange, but the plan—the first sincere effort to establish a great cooperative association for the Northwest fruit industry—was dashed on the rocks of individualism, local jealousies, and possibly hostile private interests.

In 1912 the apple crop of the Northeast was the largest in history. In previous years when the Northeastern apple crop was lighter, New York, Boston, Philadelphia, and Chicago were able to absorb western apples and pay good prices, but when the Northwest dumped 12,000 carloads of apples on top of the heavy eastern crop, prices fell disastrously and even below half the cost of production. Many growers were completely ruined. "Some actually abandoned their orchards, others committed suicide, and had the banks and those holding mortgages wished to foreclose, 75 per cent of the ranches would have changed hands." The apple-growing industry in the Northwest was pervaded by a feeling of apprehension and pessimism, and many believed that the day of the apple business was over.¹⁵

¹² Oregon State Horticultural Society, *Annual Report*, 1911, p. 22; *Better Fruit*, 5(12):50, 53 (June 1911).

¹³ Quoted in *ibid.*, 50.

¹⁴ *Ibid.*

¹⁵ Lewis, "Cooperation in the Pacific Northwest," 7.

Many more optimistic leaders contended that the malady from which they were suffering was not overproduction but a lack of intelligent marketing, with a resulting glut of markets, cutthroat competition, and ruinous prices. E. H. Shepard, editor of *Better Fruit*, maintained that the supply was not too large for the United States, but merely far in excess of the existing system of distribution. He believed that the demand could be greatly increased if fruit growers were willing to act in harmony and organize themselves in a businesslike way, and pointed out that Northwestern apple growers had done nothing during the past ten years to create a wider distribution or greater demand for their product with the result that consumption had remained more or less stationary. On the other hand, the banana industry had managed to increase its sales through a well-organized agency from \$5,877,838 in 1910 to \$14,368,330 in 1912. This remarkable increase had taken place despite the fact that the banana can be used in few ways, whereas apples can be served fresh, cooked, canned, and evaporated, or made into cider and vinegar.¹⁶

To increase the consumption of apples, *Better Fruit* published a special number in 1912, which was called the "Educational, Cooking Edition—An Aid to Greater Consumption and Better Health—Two Hundred and Nine Ways of Serving the Apple."¹⁷ A copy was sent to every large dealer handling Northwestern apples, with the request that he submit it to the leading newspaper in his town for review, and this was done in a large number of instances. The International Apple Shippers' Association made arrangements to republish this special edition of *Better Fruit* in booklet form for distribution to all jobbers, and they in turn were to redistribute copies to the retailers and consumers.

Better Fruit advocated an extensive and effective advertising campaign which would feature the health and beauty aids of the apple. Doctors and health commissioners were to tell the American people that "an apple a day keeps the doctor away," that "every youngster needs an apple when his daddy needs a smoke," and that the judicious use of apples would give people rosy cheeks, happy smiles, sparkling eyes, and an elastic step. National apple days were to be observed throughout the country. Through publicity by the Portland Commercial Club, the apple day became nation-wide, and most newspapers in the United States published tributes to this fruit. Dining cars on the railroads and the leading hotels featured apple menus.

Better Fruit deplored the jealousy among the apple sections of the country. "It is right, good and proper," it said, "to praise and even to boost the quality of fruit in every section, but it hurts the industry, and ultimately your own section, to knock other sections. The customer is told by the Westerner that Eastern apples are fit only for cider and vinegar. The Easterner tells the customer that Western apples are good to look at but no good to eat . . . people

¹⁶ *Better Fruit*, 7(9):10 (March 1913).

¹⁷ *Ibid.*, 7(4):1-68 (October 1912).

buy Western apples once, but never twice."¹⁸ Such tactics, it contended, would prejudice the consumer against all apples, and drive him to oranges, bananas, and grapefruit.

The persistent problem was to develop a broader market for the increasing apple crop from the 400,000 acres in the Northwest which yielded 15,000 carloads in 1912 and which was estimated to yield 25,000 or even 50,000 carloads in the near future. Leaders of the industry called upon the growers to consolidate, at least by districts, and thus eliminate duplication of managers, stenographers, bookkeepers, and other expenses.

A conflict ensued between the principles of privately owned selling agencies and cooperative agencies. The largest private organization handling Northwestern fruit was the Northwestern Fruit Exchange, a stock corporation established in 1910 with general offices in Seattle.¹⁹ It was affiliated with the North American Fruit Exchange, an organization which had expert salesmen in the important fruit markets of the United States, Canada, and Europe. The Northwestern Exchange claimed that it enjoyed their exclusive service in the sale of Northwestern fruits and was supplied by them with valuable information on the supply, demand, and prices of apples and pears. It also claimed the credit for introducing the system of selling f.o.b. into the Northwest.

The Northwestern Exchange attempted to become the selling agency for the majority of the fruit growers in the Northwest, and a number of the strongest district associations like the Rogue River Fruit and Produce Association, the Hood River Growers' Exchange, and the Cashmere Fruit Growers' Union did affiliate. The arguments given by these groups for affiliating with the Exchange, instead of organizing a comprehensive cooperative organization, were that a stock corporation offers the same advantages as a pure cooperative, and at the same time retains the efficiency of the modern business corporation, and that a cooperative includes strong and weak districts and aims to find markets for both, thus delaying the process of the survival of the fittest among the fruit growers. "The sooner those districts of the Northwest which are not pre-eminently fitted for the production of high grade fruit get out of the fruit business, the better for themselves, and for the whole Northwest. . . . From the standpoint of the favored districts, if there is to be any cooperation in the marketing of fruit, the circle should be a select and exclusive one."²⁰ Many of the clients of the Northwestern Fruit Exchange maintained that under the present economic system, farmers' cooperative buying and selling agencies could

¹⁸ W. G. Paine, "How to Make the Apple a More Valuable Asset," *Better Fruit*, 6(12):47-50 (June 1912); 7(9):10, (12):24 (March, June 1913); U. G. Border, "Cooperation in Advertising the Apple," *ibid.*, 8(3):16-19 (September 1913); Oregon State Horticultural Society, *Annual Report*, 1913, p. 21.

¹⁹ Lewis, "Cooperation in the Pacific Northwest," 7.

²⁰ A. C. Randall, "Results of the Northwestern Fruit Exchange, 1913-1914," presidential address at Rogue River Fruit and Produce Association, Medford, Oreg., Dec. 21, 1913, printed as pamphlet.

not meet the competition of capital, which is better organized, more stable, and more experienced. A number of fruit growers suspected that eastern interests controlled a large share of the stock of the Exchange and feared that they might ultimately control the entire marketing machinery. Consequently, it finally lost the support of all except a few large producers. However, it became firmly established in Washington, especially in the Wenatchee district.

Many of the growers wanted an organization of their own along the lines of the California Fruit Growers Exchange. Spokane, which was the first city in the Northwest to realize the importance of the fruit industry, and which had initiated the first national apple show on a carload basis, sent out a special invitation in 1908 asking the leading fruit growers of the Northwest to participate in a conference on marketing problems. The response was encouraging. Several hundred leading growers, railroad traffic managers, presidents and cashiers of banks, and other businessmen attended. It was generally agreed that an organization must be effected to dispose of the increasing crop at satisfactory prices. After considerable discussion, it was decided to hold another conference of growers and businessmen at Spokane on December 16, 1912. This meeting was attended by some two hundred and fifty prominent representatives from all of the fruit sections of the Northwest. It was characterized by enthusiasm and harmony, with prominent bankers and railroad men taking an active part in the discussions. The interest of outstanding businessmen in the problems discussed demonstrated that the fruit industry was becoming one of great importance to the entire Northwest. It was proposed that the growers of a district with shipping facilities for assembling carload lots were to organize a local association. The superintendent of the local was then to secure the signatures of the members to a contract, whereby they agreed to market all their products through the distributors, thus preventing any farmer from bolting to the agent of a commission house who might offer higher prices in order to destroy the organization. Districts as large as the Willamette Valley were to organize into subcentrals, composed of two delegates from each local. The superintendent of the subcentral was to inspect the packing and investigate the quantity of fruit.

Without a dissenting vote, it was agreed to organize a mutual corporation to be known as the Pacific Northwest Fruit Distributors. The purpose of this coöperative was to establish an orderly market, bring about an intelligent distribution of Northwestern fruit, and maintain satisfactory prices. This organization with a home office at Spokane divided the Northwest into nine districts: Wenatchee, Yakima, Hood River, western Oregon, Walla Walla, southern Idaho, Lewiston-Clarkston, Spokane, and Montana. The nine trustees, most of them prominent growers, were to meet from time to time in each of the leading fruit districts in order to better understand their conditions and needs. This information was to be passed on to the central organization, composed of one delegate from each subcentral and managed by salaried officers, expert fruit men, and skilled students of marketing. Through some sixty

general agencies in the large cities of the United States and abroad, the officers of the central were to be kept in touch with the markets of the world. The manager was to notify the subcentrals where to ship carloads of fruit for the best prices, while seeing that the markets were kept supplied but not glutted. The central was then to direct the shipments, sell the fruit, and remit the proceeds through the subcentrals to the locals. The central also undertook to finance growers during the growing season.

This organization appeared to be a brilliant success. It included the Yakima Fruit Growers' Association, the Hood River Valley Growers, the Idaho-Oregon Fruit Growers' Association, and a number of other associations with some one hundred and fifteen locals, controlling about 50 percent of the entire output of the four Northwestern States.²¹ It shipped 4,000 cars of fruit during 1913, the first year, and over 5,000 the following year. Soon, however, old jealousies among the various districts began to reappear. Each insisted on maintaining expensive overhead. Many of the leaders did not seem to show confidence in the organization, and the growers who were not given a sufficient opportunity to express their opinion failed to support it from the start. Furthermore, in view of the limited tonnage under its control, too much was expected in a short time.

During the next few years, the Northwestern fruit growers held meetings to discuss the situation. A council was formed of representatives from each district, and it in turn designated an administrative committee. While plans for a clearing house were discussed, nothing tangible resulted, due again to lack of support and recurrent jealousies.

The World War had a disturbing effect on the apple industry. Prior to the war, the United States exported about 7 percent of the normal commercial apple crop, and England and Germany were the two best foreign customers.²² During the 1914-15 season, the United States exported some 2,667,873 barrels and 1,423,132 boxes of apples,²³ and of this amount, England took 1,799,236 barrels and 1,096,045 boxes. Practically all the boxed apples came from the Northwest. Due to the blockade, Germany could not secure American apples, and even England reduced her purchases considerably during 1917 and 1918. Her embargo of March 1917 placed apples on the luxury list, and this action naturally affected the industry. Countries like Norway and Sweden and those of South America were anxious to buy American apples, but the ships were being used to carry wheat, ammunition, and men.²⁴

²¹ *Better Fruit*, 7(7):36-37, 40-42, (8):34, (9):28 (January, February, March 1913); Oregon State Horticultural Society, *Annual Report*, 1913, p. 81-88.

²² *Better Fruit*, 10(4):12 (October 1915).

²³ The 1912 crop of more than 235,000,000 bushels was high; the 1913 crop was small; the 1914 crop of some 253,000,000 bushels was the largest on record.—U. S. Department of Agriculture, Bureau of Agricultural Economics, *The Apple Situation, 1931*, p. 1 (Washington, 1931).

²⁴ For a summary of the reports of the U. S. Bureau of Foreign and Domestic Commerce on apple exports during the war years, see "United States Export Trade in Apples," *Better Fruit*, 15(3):17-18 (September 1920).

At the urgent request of fruit growers, businessmen, and bankers, the Federal Bureau of Markets sent out three experts to study the Northwestern fruit industry in 1915. The agents interviewed a number of leading growers, and, after considerable discussion, called a meeting at Spokane, where it was agreed to organize the Fruit Growers' Agency to be composed of individual fruit growers, growers' associations, and growers' selling agents who handled 100 or more cars of fruit annually and who resided in the Northwest. The organization succeeded in eliminating a number of small handlers and buyers, thus reducing overhead expenses. It standardized the entire pack of the Northwest and worked out plans for developing the domestic and foreign markets.²⁵

To offset the partial loss of the European markets, the people of the Northwest, in cooperation with the United States Bureau of Foreign and Domestic Commerce and the Consular Service of the Department of State, studied the markets of the Far East, Australia, and South America. In 1917, the Northwest shipped to China alone 16,556 boxes of apples, which sold at good prices.²⁶ The people of Latin America were also being educated to eat American apples.

Even more important than the foreign market was the expansion of the domestic market. Never in the history of the apple business was there as wide distribution of the fruit in the home market as during the war. A large number of communities which had never before purchased Northwestern apples now began to buy them in considerable quantities. This expansion was due in part to a publicity campaign which the United States Government and the fruit growers of the Northwest carried on to induce the American people to eat more fruit. Northwestern apple growers could not fail to see how the California citrus industry had greatly increased the demand for oranges by means of extensive advertising. At one time, 1,400 carloads of oranges had been considered an oversupply; by 1918, after an extensive advertising campaign, California was selling 50,000 carloads per year. Northwestern apple growers were convinced that higher prices were received for oranges because they were better known.

At the national apple show in Spokane, the advisability of staging a general campaign to advertise one brand for all Northwestern apples was frequently discussed, but the idea did not meet with the approval of most apple districts. In 1913, the Hood River Apple Growers' Association undertook a moderate campaign in Los Angeles and San Francisco to advertise the Blue and Red Diamond brands. The results were so satisfactory that the board of directors felt justified in recommending a more comprehensive campaign to be carried on in New York and other cities the following year. In 1914, the Northwestern Fruit Exchange introduced the Skookum brand to eastern customers by advertising extensively in such magazines as *Good Housekeeping*, the *Literary Digest*, and the *Saturday Evening Post*. From \$70,000 to \$100,000 were spent on

²⁵ Lewis, "Cooperation in the Pacific Northwest," 32.

²⁶ Oregon State Horticultural Society, *Annual Report*, 1918, p. 98.

one season's advertising campaign with highly satisfactory results. The unique name and the smiling Indian imp on the labels attracted much attention and created a demand for the brand. In 1916, the Yakima Fruit Growers' Association ran a full-page display in the *Saturday Evening Post* and several smaller advertisements on the "Big Y" apple.

The Federal Bureau of Markets undertook to cooperate with the growers to improve the marketing methods by reducing unnecessary expense, eliminating waste, and preventing duplication and gluts. Agents of the Bureau were stationed at Spokane to study the daily movement of fruit cars, including their destination and diversion to markets other than those to which they were originally shipped. The information secured from the railroads was summarized and sent to the various growers' associations. The Government's assistance might have proved even more valuable if the growers had been more cooperative.²⁷

The agency ultimately failed because the Government withdrew its active support too soon and because no proper arrangements were made to finance it. Perhaps it engaged in activities not strictly within its field. Nevertheless, a great deal of good resulted from it. Whereas from 1910 to 1912, with a tonnage of 8,000 to 10,000 cars, the cry was overproduction, during 1916 to 1920, when the tonnage of Northwestern apples ranged from 20,000 to 35,000 cars, there was little talk of overproduction. The entire apple industry of the Northwest had been placed on a sounder basis during this period of reorganization.²⁸

When the World War ended and England lifted the embargo on fruit, there was a great demand for American apples, particularly in the United Kingdom, Sweden, Denmark, and Holland. The year 1919 was one of the most prosperous seasons for the Northwest apple industry; the crop was good and prices were high. The opening of foreign markets and the wider market at home led many to think that the demand would increase. Prosperity and aroused hopes naturally attracted people to the industry, and new orchards were started throughout the Northwest.²⁹

Increased plantings presented the problem of marketing still larger crops. During the 1923-24 season, Washington, Oregon, and Idaho produced more than 37,800,000 boxes of apples. It was predicted that the Northwest would soon be producing more than 50,000 carloads annually. With the saturation point for the United States around 90,000,000 boxes, there was danger that production would exceed consumption and ruin the entire industry. Apple growers were beginning to realize that the per capita consumption of the orange, the banana, and the pineapple was increasing in the United States, whereas that of the apple was declining. The orange had excelled the apple in popu-

²⁷ *Better Fruit*, 10(7):20, 23-27, 31-32 (January 1916).

²⁸ Lewis, "Cooperation in the Pacific Northwest," 32.

²⁹ "Future Prospects for Markets for Our Apples Abroad," and "The War and the Fruit Industry," in *Better Fruit*, 13(11):10, 14 (May 1919); Oregon State Horticultural Society, *Annual Report*, 1919, p. 46.

larity. During the 1920's apple prices fluctuated greatly, often dropping below the cost of production and transportation, and obviously the growers could not continue producing under such conditions.³⁰ There was evident need for a widening of the market and greater economy in marketing in order to secure a larger share of the consumer's dollar for the producer.³¹ The cry was "stabilize, economize, advertise, Oregonize!"

Northwestern apple growers have always deplored their greatest handicap—the longer hauls and higher freight rates as compared with those of eastern and midwestern producers. In the Chicago and New York markets, Northwestern apples had to compete with those from twenty-five States, many of them neighboring localities. At all horticultural meetings in the Northwest, the question of the high cost of transportation was uppermost. When the Panama Canal was completed, the Northwestern growers hoped that water transportation to the Atlantic markets would greatly reduce the cost of shipping their produce. In 1914, the American-Hawaiian Steamship Company experimented with several shipments from Oregon to New York. The first cargo reached its destination in good condition, but the second shipment was less successful, due to the fact that the refrigerator machinery broke down. One boat made the distance from Portland to New York in twenty days, while the other took thirty days. This experiment indicated to the steamship companies the possibilities of developing water transportation for Pacific Coast fruit.

It was not until 1920, however, that any direct apple trade with Europe was undertaken. Until then, all Northwestern apples destined for European consumption were sent in refrigerator cars to the Atlantic seaboard and transhipped on steamers equipped with coolroom space. In 1920, the Royal Mail Steam Packet Company, which had been studying the fruit shipments to Europe, made arrangements with the Holland-American line to establish a joint service of 12,000-ton vessels equipped with coolroom and refrigerator space for the transportation of fresh fruits, meats, and fish. The company planned to maintain regular monthly sailings between the North Pacific Coast and London, Amsterdam, and Rotterdam. The experiment proved successful, and during the following season, more than 750,000 boxes of apples were shipped directly to Europe.³² With rates from Hood River to Portland at 6½ cents per box, and from Portland to Liverpool by water 90 cents, the Northwestern growers could compete with exports from the Middle West. Shipping via the Panama Canal, however, did not prove to be the panacea to which the Pacific Coast growers had looked forward for many years. Some of the vessels had a capacity of about 160,000 boxes of apples, or 280 carloads. There was, there-

³⁰ W. F. Gwin, "1920 Apple Prices Are Less than Production in Many Instances," *Northwest Fruit Grower*, 1(5):17 (November 1920); Lewis, "Cooperation in the Pacific Northwest," 7.

³¹ For data on the cost of producing apples, see *Better Fruit*, 5(6):44 (December 1910), and U. S. Department of Agriculture, *Bulletins* 446, 518, 614, 851.

³² J. C. Robinson, "The Possibilities for Water Transportation of Northwestern Apples," *Northwest Fruit Grower*, 2(1):3 (January 1921); *Better Fruit*, 15(11):25 (May 1921).

fore, danger that several large shipments might arrive in Europe at too close intervals and cause a glut in the market unless the shipments were carefully controlled. Furthermore, at the beginning, transportation through the canal took much longer than by rail to New York and thence by water to Europe, and the saving in freight rates was not as great as anticipated.³³ The steamship companies claimed that the installation of refrigerator machinery was not only costly but meant a displacement of cargo space. And too, since the boats for shipping Northwestern apples were in use only six to nine months of the year, and as there was insufficient perishable cargo westbound from the Atlantic Coast to justify their operation to the Pacific Coast, the outward shipment had to be assessed with rates high enough to compensate for operations in both directions.

Additional reasons often made it more desirable to ship fruit from the Pacific Coast to eastern markets by rail. Quite frequently large quantities of apples were shipped and sold while en route to the eastern markets. The question of rail rates naturally assumed great importance. Prior to June 1918, the rate was \$1.00 per hundred pounds, or 50 cents per box to all points east of the Missouri River, except to the Southeast. On June 25, 1918, the rate was increased to \$1.25 per hundred pounds. When the growers protested and appealed, the Government made a temporary reduction on October 23, 1918 to \$1.10 per hundred pounds. This rate remained in effect until May 31, 1919 when the \$1.25 rate was restored. On August 26, 1920, under the influence of post-war inflation, it was increased to \$1.66½. On July 21, 1921, however, it was reduced to \$1.50, where it remained until a further reduction to \$1.25 per hundred pounds to the eastern markets for domestic consumption and \$1.00 for foreign shipments was established.

The fruit growers of the Northwest complained bitterly against the high-handed and blind policy of the railroads. They argued that high freight rates were killing production in the Northwest. When transportation consumed one third of what a car of apples realized, the growers did not receive a fair profit.³⁴ Moreover, they complained that a shortage of refrigerator cars contributed further to their difficulties. They maintained that the best way for the railroads to procure more income was to carry more tonnage at rates which would encourage production rather than restrict shipping. They advised the railroads to encourage larger tonnage and more economic operations by lowering overhead.³⁵ To solve the transportation problem, the growers organized to encourage the shipping of fruit by water to the Gulf and Atlantic States as well

³³ Hector Macpherson, "Some Problems in Marketing Northwestern Apples," Oregon State Horticultural Society, *Annual Report*, 1924, p. 104; H. L. Hudson, "Transportation Facilities," *ibid.*, 58; "Shipment of Pacific Coast Fruit [editorial]," *Better Fruit*, 16(5):6 (November 1921).

³⁴ A car with 798 boxes of apples, sent from Washington to New York City in 1922, grossed \$2,090.05 and netted \$965.05, the railroads receiving \$661.27 for carrying charges. "The Growers Share from a Car of Apples [editorial]," *Better Fruit*, 17(3):8 (September 1922).

³⁵ "High Freight Rates Killing Production [editorial]," *Northwest Fruit Grower*, 2(1):5, 14 (January 1921).

as to Europe and the Orient. They negotiated with representatives of steamship lines and appealed to the entire Northwest to support them in their fight against the high railroad rates.³⁶

In 1922, the Northwestern growers asked the Interstate Commerce Commission to reduce the rate to \$1.25 per hundred pounds, but the request was refused. An appeal was then made to the officials of the railroads. In September 1924, representatives of all the Northwestern carriers met with representatives of the fruit districts at the Portland Chamber of Commerce. The growers argued that the 50 percent advance in rates since the World War was a discrimination against the boxed-apple industry of the Northwest, as the average increase throughout the country had been only 33½ percent, that this increased burden was borne entirely by the growers and not by the consumers, and that unless the freight rates were reduced they would lose the markets which had been won through the production of quality fruits to the Eastern and Middle Western producers who enjoyed much lower rates. Investigations were made by railroad economists and other experts, but no freight reductions resulted. Railroad officials maintained that in view of the higher wages they were paying, they could not afford to reduce rates and insisted that their earnings were insufficient to justify such action. Unless the roads made reasonable returns on their capital, they would be unable to obtain money through loans or sale of bonds with which to equip and maintain improved service. They argued that the Northwestern fruit industry suffered more from its haphazard marketing methods, from too many middlemen, from too many cross halts in the search of markets, and from the failure to advertise and stimulate sales. The carriers resisted the complaints which the growers made to the Interstate Commerce Commission.

During the 20's, growers, shippers, bankers, and railroad officials agreed that an extensive advertising campaign to educate the American people to eat more apples, especially Northwestern apples, was not only desirable but absolutely necessary if the consumption of apples was to keep pace with increased production and increased competition with the orange, prune, banana, grapefruit, and raisin. To keep King Apple on the throne, the growers must get behind and put over some nation-wide publicity. Many of the growers felt that while a general campaign which would wipe out sectional lines could claim certain advantages, it also presented numerous problems. In the first place, it seemed illogical to organize the barreled and boxed apple sections of the east and Northwest, for their interests were basically irreconcilable. Should the publicity campaign prove successful, the east with its advantageous freight rates would then tend to increase production to the detriment of the already handicapped Northwestern growers. Furthermore, since the eastern growers were not so well organized as those in the Northwest, it would be more expensive to collect

³⁶ "Fruit Growers Present Strong Protest Against Increased Freight Charges [editorial]," *ibid.*, 1(4):4, 11, 13 (October 1920).

money in the east, thus the Northwest would pay a greater share of the cost of advertising.

A number of the leading growers, headed by *Better Fruit*, decried too much competition among the fruit districts of the Northwest and advocated an all-Northwestern boxed apple organization to stage a "general cooperative advertising crusade." It was suggested that about \$500,000 could be raised through an assessment of 1 cent per box from the growers and allied interests. This sum would be matched by the dealers and spent in advertising Northwestern apples. Unfortunately, jealousies arose even within the districts of the Northwest. Many believed that the interests of the Washington, Oregon, and Idaho apple growers were not always mutual. Washington growers complained that Idaho shipments in bulk and in baskets competed with boxed apples. Many of them believed that an advertising campaign on a State basis would have unity of purpose and interest. All efforts, therefore, to bring the Northwestern growers together for advertising purposes failed. Each district planned to carry on its own publicity. Wenatchee promoted a \$200,000-a-year campaign, "Eat Wenatchee apples." Although Oregon was desirous of cooperating in boxed-apple promotion, she was less concerned, for she shipped most of her apples to foreign markets. In 1923, the Hood River Apple Growers' Association carried out a novel method of advertising its product when boxed apples of the Diamond Brand on two large trucks with display bodies were driven across Texas, Louisiana, Missouri, and Colorado.³⁷

Advertising was, however, only one phase of the marketing problem confronting the Northwest apple industry during the 20's. The great need voiced at all horticultural meetings was cooperative organization. "The fruit growers of Oregon have been awakened," asserted the editor of *Better Fruit*. "It took a severe jolt to get them out of the rut, but the jar has fully opened their eyes. The rich possibilities for the big, rapidly-growing fruit industry of their state, fostered and completely controlled by a state-wide cooperative organization entirely in the hands of the growers has at last sunk in."³⁸ Another writer, in 1921, declared that "the Pacific Northwest is a seething caldron of unrest as regards marketing . . . at no time in the last ten years, has the Northwest shown as much interest in marketing as today."³⁹ A veritable battle was beginning between the speculative, commercial type of organization owned by private interests in the east, and the cooperative, service type owned by the growers themselves, to determine whether the growers were to carry on their own marketing or whether the eastern private interests were to exercise control.

In order to eliminate the speculation which had contributed to the instability of the Northwest fruit industry for years, leading growers assembled at Port-

³⁷ "Unique Plan of Marketing Apples [editorial]," *Better Fruit*, 18(5):10, 14, (6):14 (November, December 1923), 21(4):8 (October 1926).

³⁸ *Ibid.*, 14(1):16 (July 1919).

³⁹ C. I. Lewis, "The Oregon Growers' Cooperative Association," *American Fruit Grower*, 41(4):4 (April 1921).

land in August 1918 to propose an association of fruit growers. Robert C. Paulus, manager of the Salem Fruit Union, was authorized to visit and study the operations of several of the big cooperative associations in California. Paulus, who was well qualified for this errand, invited Aaron Sapiro, the cooperative expert and attorney for the largest cooperative associations of California, to come to Portland to help outline a plan of organization for Oregon fruit growers. The plan finally worked out by Sapiro in cooperation with a fruit-growers' committee provided for a union of all fruit and vegetable growers of the State. The Oregon Growers' Cooperative Association was the most complete and purely cooperative body organized on state-wide lines that had been undertaken so far in the Northwest. To comply with the Federal requirements concerning farmers' marketing associations, and in order to be able to secure necessary funds, two bodies were formed. The first, called the Oregon Growers' Cooperative Association, was a non-speculative, non-profit, non-capital organization whose main function was to market the fruit of its members at cost. Since an organization must have capital and plants to operate successfully, a second body was incorporated known as the Oregon Growers' Packing Corporation. Any person or firm that produced fruit was eligible for membership upon payment of the membership fee of \$10. Each member was also to take one \$10 share in the Packing Corporation for each of his bearing acres. Preferred stock was also sold to growers, investors, and bankers. These stocks were to be retired at the rate of one-fifth a year. The money was to be invested in plants which were to belong to the grower members. All members had equal voting power and the same directors and executive committees had charge of both bodies to assure cooperation. Upon the receipt of fruit from the Growers' Association, the Packing Corporation was to give the former a warehouse receipt with which it could in normal times borrow money from the banks. An element of strength was the long-term contracts. Every member was signed up for not fewer than five years, thus enabling the cooperative to equip the necessary plants. This was a feature of the California fruit cooperative which in turn had been patterned after the successful dairy and egg cooperatives of Denmark. In one respect the Oregon Growers' Cooperative differed decidedly from most of the California cooperatives. The latter were organized by commodities: one for citrus fruit, another for dried peaches and figs, another for prunes and apricots, etc., while the Oregon cooperative handled all fruits and vegetables,—apples, prunes, pears, berries, walnuts, and broccoli. In reply to those who used this diversity of interests as an argument against the organization, the advocates of the Growers' Cooperative pointed to the success of Armour and Company, Montgomery, Ward & Company, and the Standard Oil Company, all of which handled many products.⁴⁰

The Oregon Growers' Cooperative was a great success at the outset. Aaron

⁴⁰ *Ibid.*, 4; *Better Fruit*, 14(1):16, 21, (3):12 (July, September 1919); *Oregon Grower*, 2(5):4 (December 1920).

Sapiro, together with ardent cooperation advocates in the State, carried on vigorous campaigns to enlist the interest of growers, bankers, and businessmen in the plan. In August 1919, when the cooperative was established, a monthly publication called the *Oregon Grower* was inaugurated to supply members with information regarding the activities of their association and the market. In one year, the organization embraced some 1,600 members comprising 28,000 acres. It built a number of modern apple-packing plants representing an investment of about \$400,000. It instituted the community grade and pack, inaugurated the fresh-fruit inspection idea, established the trade name "Mistland" for its first-class fruit, and spent large sums of money advertising this brand. This was the first attempt to advertise Oregon fruit on an extensive scale which resulted in a widening of the market. Its representatives in the leading eastern markets helped to build up a strong marketing organization. The Cooperative saved its members large sums of money on the purchase of materials, and its grower's service aided them during critical times. Its bank credit was very good.⁴¹

For several years, the Oregon Growers' Cooperative, with its 2,000 or more members, was so successful that it was watched by fruit producers of the entire Northwest. A number of causes, however, were responsible for its decline and final collapse in August 1924. In the first place, it was a difficult time to launch such an organization, due to the drop in commodity prices, the tightening of credit, and the ruin of crops by rains. Secondly, it was fought by many private interests who stirred up discontent and disloyalty among the growers. Finally, the association unwisely overinvested in plants and machinery equipment when costs were at their peak, and when it expected to handle about 80 percent of the fruit instead of the actual 40 percent. An added weakness was the diversity of products which the organization undertook to handle. There was too much suspicion among the members, many of whom believed that funds were being mixed.⁴² By 1922, friction within the organization became more pronounced. For instance, the Medford district, given a capital investment much greater than its local stock subscription, constantly asked for more, and refused to cooperate. A number of members threatened to withdraw, although the State courts upheld the binding nature of their contracts. In 1923, the Cooperative attempted to reorganize, and the next year, it ceased to function. Its property was sold to meet the mortgage and stock indebtedness so far as possible.⁴³

Though the Oregon Growers' Cooperative Association failed, the cooperative idea was preserved in strong locals. Many believed that "there is no state or

⁴¹ According to the *Oregon Grower*, the membership was as follows: December 1919,—500 with 12,000 acres; December 1920,—1,600 with 28,000 acres; April 1922,—2,000 with 32,000 acres. See *ibid.*, 1(5):9 (December 1919); 2(5):9, (9):5 (December 1920, April 1921); 3(9):8 (April 1922). Lewis, "Oregon Growers Cooperative Association," 4.

⁴² *Ibid.*, 5(12):8 (July-August 1924). See also Robert Murkland Haley, "The Oregon Growers Cooperative Association with an Analysis of the Causes of Its Failure," (MS., Oregon State College Library, Corvallis, June 1927).

⁴³ *Oregon Grower*, 5(3):5-6, (12):8 (October 1923, July-August 1924).

political boundary to any economic unit" and that it would be necessary to organize the entire Northwest, and not merely a district or State. In 1923, a movement was started in Hood River and Portland to hold a discussion to be led by Aaron Sapiro on the fundamentals of collective bargaining in order to promote a wider distribution of fruit and prevent the glutting of markets. In the opinion of Sapiro, the apple growers of the Northwest could choose between two types of organization: a union of the growers into a powerful centralized federation which would take full control of the fruits produced by the units; or merely a coordination of the grower units for better working toward a common purpose. The discussion aroused considerable enthusiasm. A committee was appointed, representing the apple districts of Oregon, Washington, Idaho, and British Columbia, to confer with the managers of the various local associations and to prepare plans for the organization of a selling exchange. The conference also approved resolutions for the development and increase in membership of all local associations; for the coordination between existing associations and other organizations that might be formed in the future; and for the centralization of grading supervision in order to establish a common grade of better fruit which was to be advertised as the brand of the superior Northwestern apple. Other resolutions dealt with the problems of transportation and export trade. The editor of *Better Fruit* who was consistently an ardent advocate of cooperation pleaded with the growers that here was an attempt to advance a movement "which practically everyone in the industry has talked about and sought to visualize" for years.⁴⁴

On August 14, representatives from the important apple districts of the Northwest, including British Columbia, again met with Aaron Sapiro at Portland to work out definite plans for a comprehensive cooperative organization. After considerable discussion, it was unanimously agreed that an organization of this kind was needed to put the apple industry on a sound and stable basis. The plan finally agreed upon provided for a Northwest apple-growers exchange to be managed by a board of trustees appointed by the affiliated associations of the districts signing the agreement. The public appointees were to be chosen by the clearing-house associations of Seattle, Portland, and Spokane, and by the State chambers of commerce of Oregon and Washington. Associations and growers handling apples on a cooperative basis in Canada and the Northwest were eligible for membership. The exchange was to coordinate all of the activities of inspection, grading, transportation, and marketing of apples delivered to the member associations at home and abroad.

The plan was quite elaborate and a good beginning toward the creation of an inclusive and powerful centralized cooperative apple-marketing agency. In answer to the criticism of many growers that the organization did not go far enough, it was pointed out that it was better to go slowly at the outset, in order to develop and strengthen into a more binding cooperative. As there was con-

⁴⁴ *Better Fruit*, 18(1):13 (July 1923).

siderable enthusiasm, it was expected that the associations would sign up rapidly and that the organization would then go into effect, but again the recurrent sectional jealousies and suspicions appeared. Some feared that it was an attempt to "put something over" on them. Few associations signed up, and another experiment failed to materialize.⁴⁵

"Northwest's apple sections must cooperate, not compete," was the great cry of the growers throughout the apple districts. Only through union could the demoralized and chaotic distribution with its inevitable losses be prevented.⁴⁶ The necessity for organization was so patent that the Washington State Chamber of Commerce called a conference of growers and shippers of the Northwest at Yakima to discuss plans. Spokane and Wenatchee appropriated \$15,000 to help organize the boxed-apple industry, and a commission was sent to study the cooperative movement in California. After careful investigation, it reported to a second meeting of the fruit growers at Yakima in April 1924, recommending the formation of a central growers exchange. The planned organization was to promote the following objectives: orderly distribution, extension of the domestic and foreign markets through advertising, reduction of labor costs and excessive retail prices, and development of by-products and intercoastal transportation. The recommendations of the commission were enthusiastically approved by the representatives of all the Oregon and Washington organizations in attendance, for under the urge of dire necessity most of the growers were in a receptive mood.⁴⁷

The plan for the new central growers exchange called for a federation of the existing cooperative shipping associations. The local associations were to handle the packing, pooling, and warehousing of the fruit and the distribution of supplies. The subexchange was to sell the fruit of a group of local associations. The central exchange was to maintain a sales organization in the markets of the world, cooperate with the subexchanges, assemble and disseminate information about sales, supervise sales in foreign markets, and handle advertising. It was decided that advertising should be conducted around a brand name which would establish the reputation of the Northwest apple. This, however, did not imply the displacement of local brands which had already been established. An appeal was made to the stronger associations to stand behind the new organization. "Too long have the Northwest apple growers," said the editor of *Better Fruit*, "delayed decisive action to save this industry. The best men of the Northwest are called to consecrate themselves unselfishly to do the things that must be done, if we are to live and prosper from the fruits of our orchards." Once more the plan failed. It fell by the wayside when a short apple crop and high-priced prospects appeared on the horizon.

Though the marketing problems of the fruit industry refused to be solved,

⁴⁵ For details of the plan, see *ibid.*, 18(3):5-6, 18, 25-26, 28, (4):14 (September, October 1923).

⁴⁶ *Ibid.*, 18(10):10 (April 1924).

⁴⁷ *Ibid.*, 18(11):10, (12):10 (May, June 1924).

they could not be ignored. In January 1927, Northwestern fruit growers held a conference at Yakima, under the sponsorship of the Washington State College extension service, to consider plans for the organization of a comprehensive fruit agency. The plan as first worked out was similar to the ill-fated Northwestern Fruit Growers' Association of 1924. It was sponsored by the Washington State and the Portland chambers of commerce.⁴⁸ After preliminary discussion, it was agreed to meet again at Seattle.

At the Seattle meeting, the representatives of the apple industry heartily approved the plan outlined by R. H. Kipp, head of the marketing department of the Portland Chamber of Commerce, to coordinate the marketing of Northwestern apples. It provided for an organization to be called the Pacific Northwest Apple Industry, which was to serve as a clearing house, with the view of obtaining better and more efficient distribution. This organization was to take in growers regardless of their membership in a cooperative association. This lack of discrimination against non-organized growers was desirable since only one third of the growers of Oregon, Washington, and Idaho belonged to cooperatives. The organization was to further a comprehensive advertising campaign. This plan, though simple in structure and involving a small measure of risk on the part of the growers and shippers in proportion to the possible benefits they would derive from it, met with opposition and again failed to materialize.⁴⁹

From 1910 to 1929 leaders of the apple industry considered ways and means of increasing consumption, preventing cutthroat competition, and glutting the market. "Organize! Organize!" was the common cry at all horticultural meetings for a number of years. Numerous plans were suggested for organizing cooperatives to coordinate the apple industry. The rocks upon which the frail crafts of cooperative endeavor came to grief were numerous. The failures were due to insufficient capital, hasty action, mismanagement, impatience, jealousy among the growers, and hostile, malevolent propaganda by private firms. Perhaps the farmer is difficult to organize. The very isolation of his life and occupation breeds in him the spirit of individualism. He is ignorant of marketing conditions, yet he feels that he knows best how the manager of a cooperative should have sold his crop, and he has his pet theories. When the returns for a year do not come up to his expectations, he is ready to denounce the cooperative and secede from it.

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⁴⁸ *Ibid.*, 21(9):8, (10):9 (March, April 1927).

⁴⁹ *Ibid.*, (10):9 (April 1927). An editorial in *ibid.*, 22(10):18 (April 1928) states that private shippers raised a million dollars to combat cooperative movements.

THE PUBLIC DOMAIN IN THE ERA OF EXPLOITATION, 1862-1901

ROY M. ROBBINS

"The public lands were entered upon the last great period of their existence; to remain wide open for the next twenty-five years, until they were closed not by a change of policy but by the fact that the resources of the Nation were exhausted."¹ In these words Professor Paxson epitomized the era of public-land history which opened with the passage of the Homestead Act of 1862. Its enactment marked the culmination of a truly impressive movement,—a crusade begun in the days of Jefferson, pushed forward in the twenties and thirties by the agrarian forces of the South and West, reinforced in the forties by the humanitarian and labor interests, and embraced in the fifties by the rising industrial prophets. In fact, it was a magnificent national democratic triumph, one which deserved complete fulfillment of the bold but noble promise which it pledged. Yet, not one of its proponents doubted that its splendid objectives might not be realized to the degree intended. Nevertheless, it should have been apparent that, unless the Federal Government took its task seriously and in solemn trust carefully guarded the remaining arable domain for the actual settler, the Homestead Act might necessarily be regarded as the capstone of a bygone era rather than the lodestone of a new democratic age.

The industrial East and the agrarian West each viewed this great measure from its own point of view. Lincoln, typical of the West, held to an economic philosophy which could hardly be appreciated at a later date by captains of industry. This rail-splitting frontiersman was interested above all in the maintenance of popular institutions. In truth, he was dismayed by the assertion that capital was not only the equal of, but actually superior to, labor in the structure of the Government. "Capital," he declared in his first annual message, "is only the fruit of labor, and could never have existed if labor had not first existed. Labor is the superior of capital, and deserves much the higher consideration." His western point of view enabled him to envision

Men, with their families—wives, sons, and daughters—work for themselves on their farms, in their houses, and in their shops, taking the whole product to themselves, and asking no favors of capital on the one hand nor of hired laborers or slaves on the other. . . . The prudent, penniless beginner in the world labors for wages awhile, saves a surplus with which to buy tools or land for himself, then labors on his own account another while, and at length hires another new beginner to help him. This is the just and generous and prosperous system which opens the way to all. . . . No men living are more worthy to be trusted than those who toil up from poverty; none less inclined to take or touch aught which they have not honestly earned. Let them beware of surrendering a political power which they already possess, and which if surrendered will surely be used to close the door of

¹ F. L. Paxson, *History of the American Frontier, 1763-1893*, p. 480 (Boston, 1924).

advancement against such as they and to fix new disabilities and burdens upon them till all of liberty shall be lost.²

Thus Lincoln, like most Americans of his day, and especially westerners, viewed the economic situation in the light of the vast areas of unoccupied fertile lands; he pointed with pride to the fact that the Census of 1860 indicated a population eight times that of the Republic when it was founded. Touched with warm emotion, he ventured in the same message to predict a population of two hundred fifty million for the near future. "The struggle of to-day," he declared, "is not altogether *for* to-day; it is for a vast future also." Little did he realize, at a time when his country had need of more population and when it possessed an abundance of good land, what the significance of that struggle "for a vast future" was to be. Little did he realize that the absence of good arable land would mean a relative reduction of real wages and a gigantic increase in the profits of capital. How could he foresee the day when paternalism for industry and finance would become a fetish, while paternalism for labor or agriculture would be regarded as a sacrilege?

The thirteenth plank of the Republican platform of 1860 contained the following significant statement: "We protest against any sale or alienation to others of the Public Lands held by actual settlers." In view of the historical background of this plank and the consequent passage of the Homestead Act, there can be little doubt that the party solemnly pledged itself to reserve the remaining public lands to the common man of America. This statement was made at the close of a decade of excessive land speculation during which Congress had granted 27,876,772 acres to western railroad corporations. Contrasting sharply with the Republican pronouncement of 1860 is the fact that during President Lincoln's administration 74,395,801 acres more were granted either directly or indirectly for the construction of western railroads. During President Johnson's administration, grants to the extent of 34,001,297 acres were made, and in President Grant's administration the amount was 19,231,121 acres.³ All this occurred before many settlers could avail themselves of the opportunities offered under the Homestead Act of 1862.

With this policy of prodigious land subsidies to railroad corporations, the actual settlers had some real grievances. In the first place, extensive areas of good land were withdrawn from entry in order to allow the corporations to make their selections. The process of selection was slow; even as late as 1880, only 34,000,000 out of approximately 180,000,000 acres granted, had been definitely located. Moreover, many of the land-grant selections were exempt from taxation, hence the railroads would generally hold their lands off the market until they brought a high price. When forced by necessity to sell, the railroads,

² J. D. Richardson, ed., *A Compilation of the Messages and Papers of the Presidents*, 6:57-58 (Washington, 1897).

³ Thomas Donaldson, *The Public Domain: Its History*, 270-273 (Washington, 1884). For the specific grants, consult the table in B. H. Hibbard, *A History of the Public Land Policies*, 264 (New York, 1924).

rather than deal with settlers, preferred to offer extensive tracts at reduced prices to land companies, which in turn held the lands for a rise on the market, ultimately exacting from the actual settler a price never intended by governmental policy. In fact, the disposition of the land-grant selections of the railroads as well as the Government's alternate sections reveals the fact that the cheap-land era of American history was rapidly passing. Down to 1880, the average price per acre on all lands sold by the railroads was about \$5—a sharp contrast to the antebellum days when good, rich lands sold under the preemption laws at the Government minimum price of \$1.25 per acre and fairly good lands under the Graduation Act were disposed of at figures as low as 12½ cents per acre. Even the Government's alternate sections within the railroad grants were not generally thrown open to preemption and homesteading; in truth, the auction was still a thriving institution, and the choicest lands went to the highest bidder. It is little wonder then that actual settlers, operating under these seemingly prohibitive conditions, became involved in disputes with railroads over claims to land, and that in most of these conflicts, in spite of a seemingly sympathetic government, the settlers lost. Though many of them were within the law—having located before the grants were made—nevertheless, they had no means wherewith to fight their cases in the courts.

About 1870, the opposition to further land grants to railroads became strong enough to preclude all further governmental largess. The cessation of the practice in 1871 was immediately followed by a clamor for the forfeiture of grants in cases where the railroad companies had failed to fulfill the conditions specified. Finally, in 1884, with the election of Grover Cleveland to the Presidency on a platform demanding forfeiture of all unearned grants, it was believed that remedial legislation would be the rule of the day. However, during his administration, only a few thousand acres were restored to the public domain.

The Democratic platform of 1888 boldly demanded the forfeiture of 100,000-000 acres or approximately half of the amount granted to the western railroad corporations. Yet, in spite of the seemingly great victory of the general Forfeiture Act of 1890, later history records that scarcely 2 percent of that amount was ever restored to the public domain. The good sense of the American people had been aroused too late to be of any real value to the poor settler. Generally speaking, the homesteader was compelled to take land many miles distant from the railroads.⁴

In a very decided sense, it can be said that the best of the remaining arable lands of the Mississippi Valley were given to the railroads. This condition forced the poor settler out on the High Plains. The general settlement laws—the preemption and homestead laws, and the modified forms of the homestead principle in such legislation as the Timber Culture Act of 1873 and the Desert Land Act of 1877—all indicate the fumbling character of Congressional en-

⁴ This is the conclusion of P. W. Gates, "The Homestead Law in an Incongruous Land System," *American Historical Review*, 41:658 (July 1936).

deavors to speed up the settlement process when all that was available for the common man of America was the High Plains and beyond.⁵ In truth, some of the region beyond the hundredth meridian was good farm land, but, all in all, one may doubt whether it should have been opened to wholesale appropriation by the homesteader. Here was pioneering at its worst—with almost insuperable difficulties in selecting land, building a home, finding fuel, drilling for water, fighting fierce winds, prairie fires, bedbugs, fleas, mosquitoes, and grasshoppers.

The discrepancy between the number of original and final homestead entries indicates to some extent the extreme difficulties which the poor man encountered in establishing a home on this last frontier. For instance, in the years from 1862 to 1882, there were 552,112 original entries, while the final entries totaled only 194,488.⁶ Perhaps the Irishman's definition of a homestead as a wager between the Government and the settler as to whether the latter could make a living, was not far from the truth when applied to the High Plains. Indeed, few settlers found lands beyond the hundredth meridian which had "only to be tickled with a hoe to laugh with a harvest." Notwithstanding, settlers were literally lured into this country, attracted by the high-pressure advertising of the railroads and even encouraged by the Government itself, to begin the grinding process of trying to harness nature—nature in her rawest form. The story of the pathetic struggle of the homesteader has been told many times in literature by Hamlin Garland, Mari Sandoz, and others; it needs no further embellishment by the historian. In the light of later events there would seem to be considerable justification for the contention that the plow should never have been allowed to break the plains.

Just about the time, however, that the Government moved to settle this vast semi-arid region, the cattle industry began to push up from Texas to meet the railroad. Hence, instead of bringing about the settlement of the remaining areas of the public domain as had been intended, the railroad inaugurated a conflict between the homesteaders and the cattle interests, the latter contending for an open and free range between Texas and Canada. In the struggle that ensued, the general settlement laws—the preëmption, homestead, timber-culture, and desert-land legislation—came to be used not so much by the actual settlers as by the cattle and sheep interests. An inspector in 1885, pointing out the lack of homesteads, declared: "I doubt if the trees standing on any timber-culture entry west of the hundredth meridian would retard a zephyr." Furthermore, Thomas Donaldson, the most competent contemporary authority on the public lands, in speaking of the Desert Land Act, declared in 1883 that the tracts taken under this act were "no more desert than the valley of the Ohio River." In fact, it was under the cover of these and other settlement laws that wealthy

⁵ For the operation of the Desert Land Act, see J. T. Ganoë, "The Desert Land Act in Operation, 1877-1891," *Agricultural History*, 11:142-157 (April 1937); and W. P. Webb, *The Great Plains*, 385-452 (Boston, 1931).

⁶ Donaldson, *Public Domain*, 1016.

stockmen operated, building up vast holdings, and leaving to the homesteader not enough of a range for the family cow.⁷ So suddenly did the cow country come into being and so powerful did the wealthy stockmen become, that by the eighties it was obvious that the Government must decide between two alternatives; either it must admit defeat in its attempt to settle the High Plains, and thus hand over the country to the wealthy grazing interests, or interfere for the protection of the settler. Should the latter course be pursued, then the Government had the further obligation of aiding the settler of the region in his conquest of nature.

If the prodigious grants of land to the railroads forced the poor settler out on the High Plains, and if he in turn became embroiled in a bitter struggle not only with nature but also with the cattle interests, then it may be conjectured that to some extent these prohibitive conditions led him to break into the Indian reservations.⁸ Completely surrounded by the white man's civilization, and with the buffalo and other game fast disappearing, the Indian was forced to make his last stand. Defeated in war after war during the years from 1862 to 1877, most of the Indian tribes were humbled and put completely at the mercy of the American Government. While eastern humanitarianism and sympathy were to play a part in the evolution of a new Indian policy, it must be recognized at the outset that the Indian was expected to relinquish his land to the insatiable white settler, whose only claim to it was that he could make better use of it. Consequently, the policy adopted in the Dawes Severalty Act of 1887 represented the fulfillment of a long-delayed desire on the part of frontier America; moreover, the operation of the law confirmed the expectations of the proponents. By 1892, it could be reported that agreements had been negotiated with fourteen Indian tribes, restoring to the public domain around 26,000,000 acres, most of which had already been opened to settlement. By 1906, about 75,000,000 acres, or about three-fifths of the entire amount of Indian land released by the Dawes Act, was appropriated by whites.

Not only were the remaining arable and semi-arid lands being appropriated by corporate interests, but probably even more significant was the fact that the Nation's valuable forests and mineral resources were passing into private hands under cover of the settlement laws. Among the most important of the difficulties which arose in connection with protection of the public forests was the fact that no single Congressional enactment provided any distinctive method for the disposal of fine timber lands, notably the pine and fir lands. Another embarrassing condition was that in ordinary surveys, the field notes did not disclose with any degree of accuracy which of the lands had valuable timber and which did not. Moreover, there was little doubt that combinations were formed among purchasers at the auction sales, whereby prices were kept down

⁷ For the building up of stock ranges under the settlement laws, see E. S. Osgood, *The Day of the Cattleman*, 203-214 (Minneapolis, 1929).

⁸ There is no satisfactory treatment of this subject. For a general summary, see W. C. MacLeod, *The American Indian Frontier*, 466-478 (New York, 1928).

to merely nominal figures. Only the best timber areas, as, for instance, the pine lands of Michigan, Wisconsin, and Minnesota, and the fir lands of the Pacific slope were wanted, and there were few buyers for the less valuable timber tracts.

These conditions of necessity led to the wholesale appropriation by corporations and capitalists of extensive timber holdings.⁹ With the rising price of lumber, it is easy to understand why depredations were increasing in an alarming manner. Against such fraudulent operations the land officials seemed helpless. Experience had taught the Government that, when frontier interests conflicted with the law, the law was virtually inoperative. In fact, by the mid-seventies it was already apparent to the Government that an impasse had been reached. A feeble beginning in the solution of the problem, however, was made in 1878 with the passage of two acts,—the Timber Cutting Act, which legalized legitimate cutting by actual settlers and mining companies, and the Timber and Stone Act, which provided for the sale of timber lands at the minimum of \$2.50 per acre. The first act, however, became nothing more than another vehicle for the artful spoliator, while in the operation of the latter act, the minimum price was uniformly the maximum price.

By the eighties, the number of timber depredations was appalling; in fact, it was true that most of the preemption and homestead entries in the timbered regions were made in the interests of lumber companies, their employees being used to perpetrate the frauds. A special agent dispatched to the Duluth district in 1885 reported that up until 1884 there had been 4,300 final homestead and preemption entries in that area, but that only one hundred settlers living on these entries were actually engaged in farming. The county records show that making entry under the settlement laws was the favorite method used in obtaining access to the valuable timber of this district. A special agent surveying Colorado Territory reported that four-fifths of the fraudulent entries were committed under the preemption system. So it was the country over. Further examination reveals that many selections were made by location of scrip issued on the basis of the Bounty Land, the Soldiers' Additional Homestead, and the Agricultural College acts, as well as the Indian cession treaties—not to mention the holdings accumulated at bargain prices under the lode- and placer-mining legislation and by purchases from railroad corporations.

The same tactics were employed to build up mineral landholdings; in fact, much of the timber land also contained rich mineral deposits. As early as 1846-47 the Government had adopted the policy of selling the copper lands of the Lake Superior region and the lead lands of southwestern Wisconsin at minimum prices, which, in practice, meant maximum prices. As for precious metals, the Government had no choice; unable to cope with the extensive rushes into the Rocky Mountain and Pacific Coast regions, it ultimately, in 1866, gave sanction to local mining legislation and regulations and allowed the free and un-

⁹ John Ise, *The United States Forest Policy*, 19-61 (New Haven, 1920).

hampered exploitation of these metals. In general, then, before 1870, it may be said that the whole mineral land system was "half grab and half gamble." In that very year, however, an act was passed providing for the sale of placer-mining lands at \$2.50 an acre; and it seemed that a new day was dawning. In 1872, the mineral lands were constituted into a distinctive class of lands subject to special conditions of sale and a schedule of prices; lode claims, for instance, were to be sold at \$5 an acre. In 1873, iron lands were given a distinct status, provision being made for their sale at auction at not less than \$1.25 an acre. A special act in the same year provided for the sale of coal lands—160 acres to individuals and 320 acres to associations—at \$10 per acre if more than 15 miles from a completed railroad, and \$20 if within that distance.

Judging from the statutes alone, one would say that the Government was making great progress in disposing of its mineral resources on an equitable and appropriate basis. Nevertheless, after this mineral land legislation had been in operation for several years, it was apparent that only a very few acres were being sold—sold, of course, at the minimum prices—and yet it was known that vast holdings were being accumulated. Obviously the same laws under which timber holdings were being created—generally the settlement laws—were being used also by mining companies. Just as the copper lands had been appropriated in the fifties and sixties, so the iron lands, including the rich Mesabi range, were passing into private hands, mostly to corporations.¹⁰ More significant still is the fact that the common man did not, perhaps could not, reap the advantages from the disposal of these valuable mineral deposits.

The practice of defrauding the Government of valuable land was not considered a very grave crime during the formative period of American history. Such frauds, however, can hardly be blamed upon the frontiersmen as a class, for among them were to be found honest and enterprising citizens, in fact, the builders of the Nation. Nor could the General Land Office in all fairness be charged with the prevailing fraud and corruption, for there were many laws that could not have been enforced. To blame any particular political party for the prevailing system might be justifiable, but it must be remembered that the American people sustained the Republican Party in power during most of this period. Perhaps some blame should be allowed to rest upon the shoulders of capitalists and speculators, many of whom openly and flagrantly violated the laws in order to appropriate for themselves the Nation's most valuable resources. Yet, was it not this wealthy class that furnished the much-needed capital for bringing into being the new country?¹¹ Scarcely anyone will deny that corporate and individual wealth had done a great deal to build up com-

¹⁰ The outstanding treatise on the iron lands is F. P. Wirth, *The Discovery and Exploitation of the Minnesota Iron Lands* (Cedar Rapids, Ia., 1937).

¹¹ The railroads as colonizing agencies are discussed in P. W. Gates, *The Illinois Central Railroad and Its Colonization Work* (Cambridge, Mass., 1934); J. B. Hedges, "Promotion of Immigration to the Pacific Northwest by the Railroads," *Mississippi Valley Historical Review*, 15:183-203 (September 1928); E. M. Parker, "The Southern Pacific Railroad and Settlement in Southern California," *Pacific Historical Review*, 6:103-119 (June 1937).

munities, but the abuses which accompanied the corporate exploitative processes were such that many people began to wonder if the very foundations of democratic America itself were not being endangered. Nevertheless, the more one studies this period of land history the more apparent it becomes that the blame for such a chaotic land system must rest with the American people themselves and the Congressmen chosen to represent them. Perhaps Professor A. B. Hart, the historian, writing in 1887, more nearly sensed the problem than anyone else when he declared:

The fundamental criticism upon our public land policy is, not that we have sold our lands cheap, not that we have freely given them away, but that the gifts have in too many cases inured to the benefit of those whom the government meant to ignore. . . . The difficulty is certainly not in the Land Office, which, in the midst of perplexing complications, has striven hard to protect our lands. The fault lies at the door of the Congress of the United States, which has the power, but not the will, to correct notorious defects in our system. Still further back, the fault is with the free citizens of the Republic, who have been too busy to insist that there should be a comprehensive land policy, providing for the equitable disposition of all classes of the public lands.¹²

By the eighties it had become recognized that the forces in the settlement of the public domain were growing more and more monopolistic and consequently less and less democratic; in fact, the Nation's public lands were being exploited in such an alarming fashion that the time was near when these resources would be appropriated not by the many but by a few individuals who had no regard for their proper utilization and little respect for the laws which attempted to regulate their use and disposition. Public-minded individuals became convinced that the Federal Government had been too free with its disposition of favors in the years between 1850 and 1880, and the result was a reaction in the form of an anti-monopoly movement. It was realized that a logical beginning toward reform could be made if Congress would codify all existing land legislation. Next in order, it would be necessary to repeal such legislation as had already served its purpose, and which in its obsolete form was serving the ulterior purpose of land monopoly. Beyond this, the remaining resources needed to be carefully classified, separating the farming and grazing lands from those of forest and mineral character. Only when these reforms had been accomplished could the Nation decide what to do with the remaining resources; and only then would the time be ripe for the Government to adopt a policy which would carefully designate those lands—if any remained—which should go to the farmer and small stockman as distinguished from those which should and could only be properly developed by corporate and individual wealth. Moreover, at this same time, it would perhaps have to preserve the most valuable and destructible resources as a permanent public domain, which under strict supervision might be used sparingly and with intelligence, thus securing these resources for the present as well as the future. Such was the ambitious program outlined for

¹² A. B. Hart, "The Disposition of Our Public Lands," *Quarterly Journal of Economics*, 1:183 (January 1887).

the Federal Government. Even to initiate this course of land reform, however, required outstanding and unfailing leadership, a leadership which could cope with the strength of those determined upon a course of exploitation.

Hence, in the eighties a movement for land reform was inaugurated which was to serve as the prelude to the later and more important movement in American history known as the conservation movement.¹³ Once begun, this movement to curb the corporate abuses in the appropriation of lands was slow in crystallizing into definite action and, as a result, the exploitation interests, convinced that the public lands might soon be closed, increased their activity. In fact, not until the railroad magnate, the cattle king, the mining baron, and the lumber monarch had established a prestige as great as that enjoyed by any capitalist of the eastern order, did the Federal Government begin the enactment of legislation pointing toward reform.

The clarion of warning had been sounded by the Secretary of the Interior, Carl Schurz, in President Hayes' administration, as well as by many scientific organizations and prominent citizens. Yet, the country as a whole did not become seriously concerned about the new land problem until the publication in 1880 of two monumental reports: the Report of the Public Land Commission appointed by Congress the year before, and the Census of 1880, which for the first time in American history contained statistics bearing on tenantry, mortgages, and the size of landholdings. Perhaps the greatest accomplishment of the Public Land Commission was the codification of the acts of Congress, nearly three thousand in number, relating to the public domain. The Census of 1880 revealed a condition which well-nigh forecast the approaching end of free and equal opportunities in the West; an end that might already have been reached. The America thus revealed stood in sharp contrast with the America of the fifties. In the earlier decade, there were tenants, renters, mortgagors, and landlords; but the general tendency was one in which the wage-earner, the day-laborer, or the farm-hand could become a freeholder if he so desired—the West was a land of opportunity, a region in which the poor man could find salvation. In the eighties, the reverse was true. In fact, a system of landlord tenantry and land monopolization was growing up on American soil which, if not checked, would soon surpass that of feudal Europe.¹⁴

Not, however, until President Cleveland's administration did the land reform movement come to a head. The appointment of William Andrew Jackson Sparks as Land Commissioner boded ill for the exploitative interests of America. Sparks was scarcely inducted into office before he suspended from final action all entries in many of the western States and Territories—in fact,

¹³ Phases of this movement are presented in H. A. Smith, "The Early Forestry Movement in the United States," *Agricultural History*, 12:326-346 (October 1938).

¹⁴ For an analysis and summary of these large holdings, see P. W. Gates, "The Homestead Law in an Incongruous Land System," *American Historical Review*, 41:665-670 (July 1936); also F. A. Shannon, "The Homestead Act and the Labor Surplus," *ibid.*, 637-651.

the greater portion of the public domain.¹⁵ He boldly pronounced an end to all cash sales. Thereafter, the public lands were to be disposed of to actual settlers only under the Homestead Act. Having accomplished these essential objectives of reform, he then asked Congress to repeal all the land legislation except the homestead laws—thus virtually asking sanction for what he had already accomplished by administrative decree. Obviously, this was not the kind of leadership essential to land reform.

Suffice to say, Sparks had overshot his mark, and an organized campaign was immediately launched against the General Land Office. The entire West protested the revolutionary action taken by the Land Commissioner. His gravest mistake seemed to be that he made no distinction between evil and good; in fact, he had closed up all land business. Congress was stunned at the usurpation of power by a subordinate official in the executive department. So strong became the opposition—even within the Democratic Party—that President Cleveland was forced to ask the dismissal of Sparks in November 1887; and in the following year, his whole program was revoked by the Secretary of the Interior. Nevertheless, at the end of his administration, President Cleveland proudly pointed to the fact that over 80,000,000 acres of the public domain had been rescued from "illegal usurpation, improvident grants, and fraudulent entries and claims, to be taken for the homesteads of honest industry."

Meanwhile, Congress was making considerable progress toward land reform. The boldness of Sparks had served one good end; the public had been thoroughly aroused and Congress could no longer hold back. Slowly but surely the reforms appeared. In 1885, by executive action, all fences were ordered down in the West, thus dealing a direct blow to the wealthy grazing interests of the High Plains. In 1887 the Dawes Severalty Act opened up millions of acres of Indian reservation lands to white settlement. This was followed the next year by an act withdrawing all lands susceptible to irrigation from entry, to be followed in 1890, with an amendment to the Desert Land Act reducing the amount of entry from 640 to 320 acres. In the same year the general railroad land-grant Forfeiture Act, cancelling all unearned land subsidies, was passed.

Finally, after six years of Congressional wrangling, the General Revision Act passed on March 3, 1891, provided for more fundamental reforms in the land laws. The law may be summarized as follows: Section 1 repealed the timber culture acts; section 2 amended the Desert Land Act to require only 80 acres under irrigation at the end of the three-year period rather than the whole 640 acres as required in the original act; section 4 repealed the preemption laws; section 5 amended the homestead acts to the effect that no commutation could take place until fourteen months after entry; section 9 abolished the oldest institution in the land system—namely, the auction; and lastly, and almost un-

¹⁵ For a comprehensive survey of the Sparks administration, see H. H. Dunham, "Some Crucial Years of the General Land Office, 1875-1890," *Agricultural History*, 11:117-141 (April 1937); also consult, J. B. Rae, "Commissioner Sparks and the Railroad Land Grants," *Mississippi Valley Historical Review*, 25:211-230 (September 1938).

noticed, was section 24 which allowed the President to set aside, by proclamation, areas of timber lands as national parks.¹⁶

The General Revision Act of 1891 climaxed a period of agitation for a land system which would curtail the extensive advantages enjoyed by men of wealth and restore the public domain to the intended objectives of 1862—that is, to a basis of equal opportunities for all, with the common man guaranteed the remaining acres of the arable domain. Paradoxically, however, just a year before the passage of this act, the Census Bureau had quietly announced the disappearance of the continuous frontier line of two to six persons per square mile. Thus, when in 1893, the historian, Frederick Jackson Turner, proclaimed the passing of the arable frontier and epitomized its significance in American history, the intellectual world, stunned as it was by the pronouncement, accepted its portents without a single dissenting voice.¹⁷ In fact, not until recent years has anyone dared to challenge the conclusions reached by Turner. Some question has been raised as to the timeliness of his declaration. To this one might say that Turner surely did not intend to herald the complete and final passing of the last acre of arable land in America. Yet, what time could have been more auspicious than 1893? Behind was the heyday of the frontier; beyond was a twilight period, to be characterized by a pathetic struggle on the part of the common man to eke out his salvation against the exploitative forces of wealth on the one hand and the even more difficult forces of nature on the other. Truly the real frontier had passed.

In spite of the general acceptance of Turner's hypothesis, few persons actually heeded its real significance. The bitter truth was not recognized: that the point of diminishing returns in the productivity of the arable public domain had been reached; and that, economically speaking, the remaining acres which the Government intended to give away would be more costly in the long run than land selling for \$10 to \$20 an acre in the settled parts of the country. It is true that some homesteaders were to find choice spots, lands which were to be wrung from the grazing interests or perhaps from the Indians, but, all in all, the Government failed to make a place for the common man on this last frontier where real economic opportunity did not and possibly could not exist. Scarcely had the decade of the nineties lapsed when the cattle and sheep kings reappeared on the High Plains where the homesteaders were struggling against tremendous odds.¹⁸ Moreover, the lower freight rates on the transcontinental railroads were encouraging the moneyed interests to turn their attention, as never before, to the last stands of virgin timber in the Rockies and on the Pacific coast. In the exploitation of this decade, the trees were soon felled

¹⁶ *U. S. Statutes at Large* (1889-91), 26:1095-1103.

¹⁷ The famous essay of 1893, "The Significance of the Frontier in American History," most easily available in F. J. Turner, *The Frontier in American History*, 1-38 (New York, 1920), and *The Early Writings of Frederick Jackson Turner*, 185-229 (Madison, Wis., 1938).

¹⁸ A. E. Sheldon, *Land Systems and Land Policies in Nebraska*, 145, 148 (Nebraska State Historical Society, *Publications* 22, Lincoln, Nebr., 1936).

along the lakes and river banks. When this had occurred, it was obvious that the day of the hand logger was over. In fact, wherever one turns in the examination of this vast western country—into the farming, grazing, mining, or lumbering regions—the bitter truth is revealed that the man without means was finding it very difficult to gain a footing. Even the boldness of President Cleveland in setting aside 21,000,000 acres as national forest reserves on Washington's birthday in 1897 was turned into a shallow victory three months later when the McKinley administration drastically modified Cleveland's action in the so-called Act of 1897, allowing the railroads to trade their worthless acres within the reserves for valuable timber land elsewhere.

Such were the exploitative tendencies in public-land history when Theodore Roosevelt became President in 1901. A firm believer in the democratic process, he boldly determined upon a course of action which he hoped would provide a new frontier for the common man of America. Immediately, he encouraged Congress to pass the National Reclamation Act, while at the same time he struck down the grazing interests which were again appropriating the High Plains. Moreover, he launched an impressive conservation program intended to preserve the Nation's most valuable natural resources.¹⁹

In spite of his daring leadership and "big-stick" policies, it remained to be seen whether Roosevelt could effectively check the exploitative forces. On the one hand, even under the strong-arm protection of the Federal Government, together with whatever aid might come from a Federal reclamation program, the question still remained: Could the common man subdue the High Plains? On the other hand, was it possible for the Federal Government to achieve its other objective of conserving the Nation's valuable natural resources? Had not these resources already passed into private hands? All in all, was the Government not pursuing the policy of locking the barn door after the prize steed had been stolen? In truth, with all due credit to Theodore Roosevelt and other conservationists, may one not say that perhaps as early as 1862 the public lands "were entered upon the last great period of their existence"—a period soon to be "closed not by a change of policy but by the fact that the resources of the Nation were exhausted?"

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¹⁹ For an interesting personal account, see Gifford Pinchot, "How Conservation Began in the United States," *Agricultural History*, 11:255-265 (October 1937).

THE ORIGIN AND EARLY DISTRIBUTION OF NEW WORLD CULTIVATED PLANTS

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This paper is confined to an introductory discussion on methods and to more or less dogmatic statements which summarize the present status of knowledge concerning the origins of New World cultivated plants.¹ A number of monographs which incorporate the detailed reasons for conclusions pertaining to the more important plants are now in preparation.

I

The chief lines of inquiry have been botanical, archaeologic, historical, philologic, and mythologic. Of these, the botanical (as outlined by N. I. Vavilov and others of the Russian school) has been most fruitful. The elements of the Russian method are as follows: 1, Determine the nature of the polymorphism of specific characteristics (varietal diversity) through morphological, cytological, and genetical studies upon material collected widely in the field; 2, Plot the natural geographic distribution of all forms of the cultivated species and its wild relatives, with especial attention to concentrations of endemic varieties and species; 3, Establish the primary center of origin where there is a coincidence of maximum varietal diversity and a preponderance of dominant genes.

The results from this method indicate that southern Mexico-Central America was the greatest center of origination in the New World, followed by the central Andean area of South America, Colombia-Venezuela, southern Brazil-Paraguay, Brazilian Highlands, Guiana Highlands, south-central Chile, the Antilles, and southeastern United States.

The archaeologist, with the help of the botanist, is uncovering and identifying an increasing number of plant remains and reproductions of plants in modeled clay, figures painted on pottery, textiles, etc. Vegetable remains, such as seeds, rinds, leaves, and even whole desiccated fruits and root systems, have been recovered in greatest number from the arid coastlands of Peru and Chile, and from the caves of the American Southwest. These include maize kernels, meal, cobs, etc.; roots and tubers of manioc, sweet potato, potato, and jícama; leaves of coca and pacay; fruits of guayaba, lucuma, and cherimoya; cotton lint and textiles; rinds, seeds, and peduncles of pumpkins and squashes; kidney and lima beans; peanuts; and avocado, quinua, lagenaria, and canavalia seeds. The Peruvian coastal area also leads in ceramic reproductions, among which have been found easily identifiable effigies of the edible parts of manioc, maize, pacay, lucuma, pepino, soursop, potato, canna, sweet potato, chile pepper, peanut, lima

¹ This paper was read for the author by Russell H. Anderson at the joint session of the Agricultural History Society with the American Historical Association at Chicago on Dec. 28, 1938. The author's research in this field has been facilitated by a grant-in-aid from the American Association for the Advancement of Science.

and kidney beans, pumpkin and squash, pineapple, cherimoya, papaya, etc. All of these modeled forms have been found in tombs of the pre-Tiahuanaco period, which has an estimated antiquity of more than 1,500 years. Elsewhere in the New World the ceramic reproductions are usually confined to cucurbits. Painted on Peruvian ceramics are, in addition to a number of the above-mentioned plants, olluco, mashua, oca, and cacti. Dendrochronology in the Southwest and dated inscriptions in the Maya area have enabled the archaeologist to postulate an antiquity of more than 1,500 years and 2,000 years, respectively, for agricultural cultures in these two areas. As is also the case in Egypt and Mesopotamia, the beginnings of agriculture in the New World apparently antedate by untold centuries or millenia the earliest dates that the archaeologist can reasonably determine. Therefore, at best, archaeology can be depended on only to determine the pre- or the post-Columbian establishment of various cultivated plants in any given area.

The historical, linguistic, and mythologic approaches are mainly "armchair" investigations of all pertinent literature. Necessarily, the documentary value of official reports, chronicles, travelogs, letters, and other narratives left by the European discoverers, explorers, conquerors, missionaries, administrators, colonists, travelers, and scientists diminishes rapidly after 1492. Within sixty years after the first voyage of Columbus, Spaniards and Portuguese had explored from California, New Mexico, and the Atlantic coast of the United States to the tip of South America; colonies had been established from northern Mexico to Chile; and trade had become established among the major colonies and with Europe, Africa, and Asia. This gave rise to many mistaken assumptions of New World nativities. These include: the English impression that peaches were native in America because Pennsylvania Indians had peach orchards in the seventeenth century (probably obtained from the Spanish or the French settlements of the sixteenth century in the Florida-Carolina area); the yet current belief that sweet potatoes were pre-European in the southeastern United States (undoubtedly introduced by the Spaniards from the West Indies); repeated statements that the banana and certain yams (as well as other early introductions from Africa and its islands) were native to the American tropics; and the long-held belief that the kidney bean, musky pumpkin, and other New World plants were native to the Old World. Historical research, therefore, can serve only as a handmaiden of the botanical approach. It is most helpful when several corroboratory statements indicate the approximate post-Columbian date of an introduction into some new area, such as the nearly contemporary statements of Oviedo y Valdez, Las Casas, and others concerning the introduction of sugar cane and bananas into Española; or in the delineation of cultivation limits, as for the potato by Cieza de Leon and Acosta.

Relatively little has been done with a comparative study of plant names in the New World, although this method has been a fruitful approach in the Old World, especially among the Indo-European and the Semito-Hamitic languages. Several factors have discouraged linguistic research: (1) No New World language

was written prehistorically; (2) Many Indian languages have become extinct, leaving little or no record; (3) Very few reasonably complete dictionaries of Indian languages exist, and the various extant word lists are quite incomplete and often erroneous. The mere outward appearance of Indian words is not sufficient—it is necessary to have analytical meanings before conclusions should be drawn. A case in point are the Nahuatl names for peanut (*tlalcacahuatl*) and cacao (*cacahuatl*). They both appear to be good Mexican words of equal antiquity; however, the name for peanut means “cacao of the earth,” with the implication that the Mexicans, already possessing the cacao, did not have a peculiar name for the peanut and managed to name it by qualifying the name of something previously known. In general, it is a safe rule to be suspicious of alternative, compound, or qualified names, as, for example, “sacred elk,” which is one Indian name for the horse, and Jerusalem artichoke, which is neither an artichoke nor from Jerusalem.

Further cautions are necessary. It must be kept in mind that not even the European terms are above reproach since most of the early explorers knew little of either writing or botany. In groping for words many a Spaniard used “melon” (muskmelon), “calabaza” (*Cucurbita* sp.), and “calabazo” (*Lagenaria vulgaris*) interchangeably. This particular looseness of terminology has led many American historians into believing that muskmelons were cultivated at the time of the conquest in the American Southwest and Southeast. In the Spanish literature, “aje,” a native name, has been applied to the sweet potato, yams (*Dioscorea* sp.), and yahutia (*Xanthosoma* sp.); and through typographical or chirographical error, “aje” (*Dioscorea* sp.), “ajo” (garlic), and “aji” (chile pepper) have been interchanged. Even in English we often say “yam” when we mean sweet potato, and “squash” when we mean pumpkin. “Potato” is an example of a word that has changed meaning, as it was used by Shakespeare and other Englishmen of his time to mean what we now designate as sweet potato. Yet more confusion has arisen from the fact that the Spanish conquerors of the West Indies, mainly the Greater Antilles where Arawak dialects were spoken, took Arawak names to the mainland, added some Nahuatl and Chibchan words, and then spread this melange over Spanish America—especially in Peru and Chile which were conquered after the Tierra Firme and Mexico. Thus one finds *maiz* (maize), *yuca* (manioc), *aji* (chile pepper), *mani* (peanut), and *tabaco* (tobacco)—all of Arawak derivation, and *camote* (sweet potato), *achiote* (*Bixa orellana*), and *tomate* (tomato)—of Nahuatl origin, supplanting popularly the Quetchua and other local names in coastal Peru.

The most fruitful form of linguistic inquiry consists of acquiring all the native names possible for any given plant over its known area of cultivation. These names should be broken down into their elemental meanings wherever possible. Then the terms should be plotted geographically, and conclusions drawn from the contiguous and discontinuous distribution of identical and related forms within and without linguistic stocks. In general, where similar name forms cover a large linguistically mixed area, the spread was both recent and rapid,

as in the Amazon Basin where the kidney bean is commonly known by the Quetchua or Guaraní term, but maize and, to a lesser degree, the sweet potato are known by local names. Conversely, where variations are numerous and extreme within a linguistic stock, and terms are altogether unrelated among unrelated languages, the implication is that the cultivation of the plant in question is of comparatively great age as with maize which is *mahiz* in Taino, *centli* in Nahuatl, *ixim* in Maya, *iziz* in Huastec, *sara* in Quetchua, *t'on'ko* in Aymara, and *abati* in Guaraní.

The mythologic approach is normally of small value since most myths and legends, including creation stories, have been obtained from tribes after they have had generations and even centuries of direct or indirect contact with European culture. Contrasting examples are the Mohave creation story which includes wheat, and the Iroquois tale of how maize came into northeastern United States.

II

The American Indians made use of several thousands of species of plants in some form or other. Of these, probably not more than two hundred were cultivated to any considerable extent. The Indians seldom cultivated other than for edible roots, seeds, and greens, since fruit trees and shrubs, nuts, berries, dye plants, fiber plants, ornamental plants, and medicinal plants were in such wild abundance that there was little need for cultivation. Practically every fruit cultivated by the Indians was at the same time present and utilized in the wild form, as in the sapotes, anonas, papayas, mamey, passion flower, avocados, guavas, spondias, cashew, pineapple, feijoa, various cacti, etc. The same is true for the agaves, annatto, chile peppers, coca, sunflower, American indigo, tobacco, cacao, and many other plants. Many of the plants that the American Indians found wild in sufficient abundance have been introduced into cultivation during the past four hundred years. These have been principally fruits, berries, and nuts (such as the pawpaw, persimmons, crabapples, plums, strawberry, blackberry, raspberry, cranberry, grapes, pecans, walnuts, and chestnuts), spices, flavorings, and drugs (for example: allspice, smilax, vanilla, sarsaparilla, tonkabean, and cinchona), ornamentals (such as zinnias, poinsettias, many orchids, cosmos, dahlias, and tuberose), and plants of various other uses (*e.g.*, sugar maple, castilloa and hevea rubber, guayule, and yerba maté). Among the most notable of wild plants used by the Indians which, as yet, have been cultivated little or not at all are the araucarias, Brazil nuts, daturas, mesquite, peyote, groundnut (*Apios tuberosa*), and tuckahoe.

Among the pre-Columbian cultivated species of the New World there was only one of definite Old World origin. This was the bottle gourd (*Lagenaria vulgaris* Ser.), native in Africa, which probably was drifted by ocean currents to South America and thence spread from Brazil to Mexico. The coconut (*Cocos nucifera* L.) was the only other cultivated species common to the two hemispheres prehistorically, and this was raised in the Old World but was

known only wild in the New World along the Pacific coast of Central America and Colombia. This species also was probably brought across by ocean currents. No other species of plant cultivated in pre-Columbian days was common to both the Old World and the New. Furthermore, only a few genera represented by species cultivated prehistorically in the New World were also represented by other species grown in the Old World. The more important of these genera are: *Gossypium*, *Phaseolus*, *Solanum*, *Amaranthus*, *Chenopodium*, and *Lupinus*. Contrasted with these are many genera, all of whose species, both cultivated and wild, are native to the New World. Among these are numbered *Agave*, *Anacardium*, *Ananas*, *Arachis*, *Capsicum*, *Carica*, *Cereus*, *Cucurbita*, *Hevea*, *Manihot*, *Nopalea*, *Opuntia*, *Sapota*, *Theobroma*, and *Zea*. However, there are numerous genera represented by wild species utilized in the New World, which are also represented in Old World flora, e.g., *Acer*, *Cocos*, *Juglans*, *Prunus*, *Ribes*, *Rubus*, and *Vitis*.

New World agriculture was essentially based on tropical and subtropical plants. The southern Mexican-Central American area gave origin to the greatest number of cultivated species, and also to the species of greatest areal distribution in prehistoric times, e.g., maize, kidney beans, and pumpkins. There is little reason for believing that the most widely distributed species were necessarily the most ancient, since agriculture probably originated independently in more than one part of the New World on the basis of one or more indigenous food plants (such as maize in Mexico, arracacha in Colombia, and manioc in Brazil), many of which local plants became secondary upon the spread of more efficient food plants originating elsewhere. Although we cannot say definitely that any one plant is the most ancient, it is possible (upon such bases as wide distribution, linguistic, and archaeologic evidence, presence of many varieties, the lack of fruit in the strict botanical sense and of wild relatives,² and dependence upon man for propagation) to determine the relatively great antiquity of maize, manioc, kidney beans, potato, arracacha, pumpkin, and yahutias. Among the more recent cultivated plants are sunflowers, cotton, cacao, and peanuts. The three most widely spread species were maize (*Zea mays* L.), pumpkin (*Cucurbita pepo* L.), and kidney bean (*Phaseolus vulgaris* L.). Tobacco cannot be listed here as the existence of several species gave it wide range. In the Andean area was developed the greatest number of closely restricted endemics, such as arracacha (*Arracacia xanthorrhiza* Banc.), quinua (*Chenipodium quinua* Willd.), and oca (*Oxalis tuberosa* Molina). This restriction can be explained easily since the plants could not survive the long distances from their cold highland habitats to other areas of comparable climate.

If sedentary agriculture is considered a criterion of civilization, then the New World probably was "civilized" before the Old World, since there is much reason for considering maize, kidney beans, pumpkins, manioc, and potatoes older than any cultivated plants of the Old World. The climatic range for

² The following plants never or rarely have viable seeds: manioc, potato, arracacha, yahutia, sweet potato, oca, mashua, olluco, and pineapple.

maize, beans, and pumpkins is wider than for any comparable Old World plant excepting possibly barley. The great variety of pumpkins, maize, kidney beans, manioc, and potatoes cannot be matched by comparable Old World plants. There is no Old World plant so dependent on man as is maize. Relatively and absolutely, a greater number of the Old World cultivated plants have wild forms and produce fruits with viable seeds.

Forty-seven crops (not specified as to species) of New World origin are listed in the 1937-1938 *International Yearbook of Agricultural Statistics*. In approximate order, according to acreage, value, and distribution, the most important are: maize, New World cottons, potato, tobaccos, New World beans, peanuts, sweet potatoes, manioc, cacao, tomatoes, pumpkins and squashes, chile peppers, sunflower, pineapple, sapote, avocado, anonas, coca, agaves, papaya, guava, and Indian fig. Plants commonly used only in the wild by the Indians (*e.g.*, New World rubbers; New World grapes, other berries, and nuts; yerba maté; vanilla; and cinchona) are not considered in making this list.

Maize (*Zea mays* L.) originated in the Chiapas-Guatemala highlands. In prehistoric times, it was cultivated from the St. Lawrence River in Canada and from Utah to Copiapo, Chile, and the Plata of Argentina. It was the most widely cultivated plant in the New World, and is now second only to wheat in acreage over the entire world. Maize was introduced into Europe before 1500, and, with tobacco and the sweet potato, rapidly overran the earth. It is now the leading crop by acreage in a number of countries, including the United States, Rumania, Brazil, the Union of South Africa, Mexico, and Yugoslavia.

New World cottons. Upland cotton (*Gossypium hirsutum* L.) originated in southern Mexico. Sea-island cotton (*G. barbadense* L.), including Peruvian cotton, probably originated in northwestern South America. These two, together with several other species, gave cotton an area of cultivation from New Mexico, Tamaulipas, and Haiti to the vicinity of Santiago, Chile. New World cottons did not become common in the Old World, where there were native cottons, until the nineteenth century; and cotton was introduced into southeastern United States by the Spaniards.

The potato (*Solanum tuberosum* L.), in several major varieties (termed seventeen species by the Russians), had multiple origins in all the Andean countries from Colombia to Chile, with the main centers in Ecuador, Peru, and Bolivia. Potatoes were cultivated from the highlands of Colombia to Chiloé Island of Chile and northwestern Argentina. Seemingly the Spaniards had carried potatoes to Europe and Mexico by the 1570's. The potato spread slowly and was not known in eastern United States until the 1680's, and seemingly was not cultivated in southwestern United States until after the American occupation.

Tobacco, in various species, was cultivated from Canada to Peru. The present leading commercial species (*Nicotiana tabacum* L.) probably originated in northwestern South America, and was raised from Mexico and the West Indies to Colombia-Venezuela-Guianas, and possibly into Peru and Bolivia.

The common northern species (*N. rustica* L.) originated in Mexico, and was raised from Mexico to Canada but not continuously. Probably the Indians of the Southwest did not cultivate any tobacco until the Spanish conquest. At the present time there is more tobacco (along with potatoes, cacao, pineapples, peanuts, sweet potatoes, manioc, and several other New World crops) raised in the Old than in the New World.

Beans of four species were commonly raised. The kidney bean (*Phaseolus vulgaris* L.), tepary bean (*P. acutifolius* Gray), scarlet runner beans (*P. multiflorus* Willd.), and the small variety of lima bean (*P. lunatus* L.), were native to Mexico. Of these the kidney bean was cultivated from eastern Canada to central Chile, northwestern Argentina, and the Paraná River. The tepary bean was raised from the American Southwest to Guatemala. The prehistoric distribution of the other two species is uncertain. The large variety of lima bean (called *pallar* in Peru) may have been native to Peru. Its distribution also is uncertain.

Peanuts (*Arachis hypogaea* L.) originated in eastern Brazil, and were cultivated from northeastern Argentina and Peru to Haiti and southern Mexico. The peanut was a latecomer to Mexico, and nowhere did its cultivation approach the northern tropic.

Sweet potatoes (*Ipomoea batatas* Lam.) originated either in southern Mexico or in northwestern South America. The sweet potato was cultivated from Jalisco, Tamaulipas, and the Greater Antilles to northern Chile and northeastern Argentina. It was spread rapidly by the Portuguese and Spaniards into Africa, southern Asia, and Oceania.

Manioc was cultivated in two species. The sweet manioc (*Manihot aipi* Pohl) probably originated in northwestern South America, and was cultivated from northern Argentina and Peru to southern Mexico, but not prehistorically in the West Indies or eastern Brazil. The bitter manioc (*M. utilissima* Pohl) originated in eastern Brazil and was cultivated in South America east of the Andes, and in the West Indies.

Cacao was cultivated in several species. The most common was *Theobroma cacao* L., native to southern Mexico and Central America. Various wild cacaos were utilized from Mexico to northern Brazil, but cacao was cultivated prehistorically only from Jalisco to Panama. The Spaniards introduced its culture into Ecuador, Venezuela, the West Indies, and elsewhere.

Tomatoes were cultivated in several species from Jalisco to southern Peru. The common large tomato (*Lycopersicon esculentum* Mill.) probably originated in western Peru. Tomatoes were spread by the Spaniards to Europe and the American Southwest, but were even slower than potatoes in gaining world currency.

Pumpkins and squashes ranked with beans among New World green vegetables. All the pumpkins (*Cucurbita pepo* L.,³ *C. moschata* Duch., *C. mixta* Pang, and *C. ficifolia* Bouche) originated in Mexico. Of these, the field pumpkin

³ *Cucurbita pepo* probably originated in northern Mexico and/or southern United States.

(*C. pepo*) was most widely cultivated from eastern Canada to northern Chile and Argentina. *Cucurbita moschata* was cultivated from the American Southwest to Peru. The true squash (*C. maxima* Duch.) originated in eastern Peru and Bolivia, and was cultivated only in South America.

Chile peppers were cultivated from Sinaloa to south-central Chile in three main species. *Capsicum annuum* L.⁴ and *C. frutescens* L. were native to Mexico, and *C. baccatum* L. was native to the Peru-Bolivia area. Through the Spaniards and Portuguese, peppers spread rapidly over the world.

A few more crops will be mentioned briefly. The common sunflower and the Jerusalem artichoke were native to eastern United States, and were cultivated from Texas to Canada. The pineapple originated in northern and eastern South America, and was cultivated from southern Mexico and the West Indies to Peru, Bolivia, and southern Brazil. The chicozapote originated in Central America, and was occasionally raised from southern Mexico into northern South America. This tree yields a delicious fruit and also much of the chicle gum of commerce. The avocado probably originated between southern Mexico and Ecuador, and was raised from southern Mexico to northern Chile. Most of the anonas, such as the soursop, sweetsop, and custard apple originated in Central America. The cherimoya originated in northern Peru and Ecuador. Coca culture originated in eastern Peru and Bolivia, and extended from Venezuela to Peru. The use of the coca leaf, however, seems to have been known in Central America at the time of the conquest.⁵ The more important commercial agaves originated in southern Mexico, especially those from which pulque and sisal were obtained. The papaya originated in Mexico or Central America and was cultivated from southern Mexico to Peru. The guava originated in Central America, and was cultivated as far as Peru. The Indian or Barbary fig (an *Opuntia*) was native to Mexico.

In summary, the leading cultivated plants, as of the period of first European contacts, in various selected areas are as follows:⁶

Eastern United States:—beans (kidney; perhaps small lima), Jerusalem artichoke (a *Helianthus*), maize, pumpkins (*C. pepo*), sunflowers (a *Helianthus*), tobaccos.

Southwestern United States:—beans (kidney; tepary), bottle gourd, cotton, maize, pumpkins (*C. pepo*; *C. moschata*), sunflowers (?).

Northwest Mexico (Sonora-Sinaloa):—agaves, beans, chia (a *Salvia*), chile peppers (into Sinaloa), cotton, guavas (into Sinaloa), maize, pumpkins, tobacco, etc.

Southern Mexico:—achiote, agaves, aje (in Yucatan), añil (?), anonas (eight

⁴ *Capsicum annuum* seemingly had a secondary center of origin in northern Brazil.

⁵ There are vague suggestions that coca had been introduced into cultivation in the Antilles and in Nicaragua.

⁶ The lists are not complete, and the plants are arranged alphabetically rather than according to importance from any basis of evaluation. They represent crops that are specifically mentioned in some early report, unless a question mark follows the name.

species), avocado, beans, bottle gourd, cacao, chayote (a *Sechium*), chia, chile peppers, cottons, guavas, huatli, jícama (a *Pachyrrhizus*), maize, mamey, manioc, nopales, opuntias, papaya, peanuts, pineapples, pumpkins, sapotes (belonging to four genera), spondias, sweet potatoes, tobaccos, tomatilla (a *Physalis*), tomatoes, etc.

West Indies:—ajes, anonas, arrowroot, beans, bottle gourds, caymito, chile peppers, cotton, guavas, imocona, liren, maize, mamey, manioc, peanuts, pineapple, sweet potatoes, tobacco, yahutias, etc.

Peru-Bolivia:—achiote, ajos, anonas, arracacha, avocado, beans, bottle gourd, canna, chile peppers, ciruela de fraile, coca, cotton, granadilla, guavas, jícama, llacon, llauta, lucuma, maize, manioc (only sweet species), mashua, oca, olluco, opuntias, pacay (*Inga* sp.), papaya, peanuts, pepino, pineapple, potatoes (highlands only), pumpkins, quinua, spondias, squash, sweet potatoes, tobacco (?), tomato, yahutia, etc.

Chile:—arracacha, avocado, beans, bromus, canna, cherimoya, chile peppers, cotton, lucuma, madi, maize, papaya, pepino, potato, pumpkins, quinua, squash, sweet potatoes, tomato (?), etc.

Nicaragua-Honduras:—ajes, anonas, avocado, beans, bottle gourds, cacao, chayote, cotton, guavas, liquidambar, maize, mamey, manioc, papaya, sweet potato, tobacco, etc.

Panama-Coastal Colombia-Venezuela:—agaves, ajos, anonas, beans, bottle gourds, cacao, caymito, chile peppers, cotton, guavas, liren, maize, mamey, manioc (sweet and bitter), papaya, pineapples, pitahaya, sweet potatoes, tobacco, etc.

Mountain Venezuela-Colombia:—ajes, anonas, arracacha, beans, caymito, cotton, cubio, guava, maize, manioc (sweet), pepino, pineapple, pitahaya, potato, sweet potato, etc.

Guianas-Eastern Brazil-Paraguay:—ajes, chile peppers, maize, manioc, peanut, pineapple, etc.

Amazonas:—beans, cacao, cashew (?), feijoa, maize, manioc, passion flower, etc.

Chaco-La Plata:—ajes, cucurbita, kidney beans, lima beans, maize, manioc, peanuts, sweet potatoes, etc.

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THE OVERPRODUCTION OF COTTON AND A POSSIBLE REMEDY

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This essay by Professor Ulrich Bonnell Phillips (1877-1934) is a discerning historical analysis of the problem of chronic overproduction of cotton in the United States. Of special current interest is the early proposal of crop limitation which is included.

The essay was originally printed in the *South Atlantic Quarterly*, 4:148-158 (April 1905), and it is here reprinted with the permission of the Duke University Press and of Mrs. Phillips in order that it may be more readily available to readers of *Agricultural History*. The three footnotes of the original version, being textual in character, have been incorporated in the text. A few changes in capitalization and method of expressing percentages have been made in order to conform with current usage, and typographical errors have been corrected.

Professor Phillips served as president of the Agricultural History Society during 1932-33. For a biographical sketch, see Fred Landon's Introduction to "A Bibliography of the Writings of Professor Ulrich Bonnell Phillips," by Everett E. Edwards, in *Agricultural History*, 8:196-218 (October 1934). See also "A Bibliography of the Printed Writings of Ulrich Bonnell Phillips," by David M. Potter, Jr., in the *Georgia Historical Quarterly*, 18:270-282 (September 1934).—*Editor*.

There can be little question that the tendency to overproduce cotton has been chronic since shortly after its production on a large scale was made possible by the invention of Whitney's gin. The tremendous extent of the territory in the Southern States available for cotton raising, the possibility of splendid profits, always in view but oftener as mirage than as reality, and the force of very strong custom among the people, white and black, have been, and continue to be, responsible for this frequent oversupplying of the market. The record-breaking proportions of the crop of 1904, now being marketed, put powerful emphasis upon this phenomenon, which a year ago was almost entirely obscured in the public mind by the fortuitous shortage of the few preceding crops. A year ago the cotton consuming world was anxious over the possibility of a decreasing supply; and many people in the American cotton belt professed a solicitude for the preservation of the South's monopoly of the cotton output, then in a fancied danger through foreign competition under the stimulation of the prevailing high prices. Thus the pendulum of public opinion swings from time to time, not always moderately but often to extremes; and thus it has swung through the whole of a century.

On the one hand, the South is said to have a practical monopoly of its great staple; on the other, it is clear that for no long period have the people of the cotton belt enjoyed as much prosperity and comfort through that monopoly as certain other peoples have had who possessed no such striking natural advantage. The case is fairly comparable to that in the Texan oil fields recently exploited. Through either mistaken or unfortunate management the great majority of the participators in the industry have failed to secure an adequate return upon their capital and labor employed.

The history of prosperity and adversity in cotton production has been somewhat similar to that in tobacco and rice production and in certain mining industries; but the scale has been larger, the dependence of the people greater, and the vicissitudes more striking. A sketch of the early period will give illustration.

Between 1793 and 1805 a number of fortunes, splendid for those times, were made by cotton planters; and the prospects were bright for the increase of prosperity. But from the time of the embargo to the end of the second war with Great Britain in 1815, the foreign market was largely cut off and the prices fell so low that some of the planters feared the complete ruin of cotton as a staple.

Upon the return of peace and the reopening of commerce the prices of cotton ranged so high for several years in succession that a veritable mania for cotton raising spread over the land, and people by tens of thousands, rich and poor, flocked into the southwestern country, into all the fertile districts from Georgia and Kentucky to western Louisiana, and later into Texas, in the hope of securing quick prosperity through the production of the fleecy staple. A graphic picture of the situation in 1826-7 was drawn by a traveler who made a journey from Charleston through Augusta and Montgomery to New Orleans and thence to Huntsville and Nashville. His letter describing the trip was published anonymously in the *Georgia Courier* of Augusta for October 11, 1827.

In part it reads as follows:

When I took my last walk along the wharves in Charleston, and saw them piled up with mountains of Cotton, and all your stores, ships, steam and canal boats, crammed with and groaning under, the weight of Cotton, I returned to the Planters' Hotel, where I found the four daily papers, as well as the conversation of the boarders, teeming with Cotton! Cotton!! Cotton!!! Thinks I to myself 'I'll soon change this scene of cotton.' But, alas! how easily deceived is short-sighted man! Well, I got into my gig and wormed my way up through Queen, Meeting, King, and St. Philip's-streets, dodging from side to side, to steer clear of the cotton waggons, and came to the New Bridge Ferry.—Here I crossed over in the Horse-boat, with several empty cotton waggons, and found a number on the other side, loaded with cotton, going to town. From this I continued on, meeting with little else than cotton fields, cotton gins, cotton waggons—but 'the wide, the unbounded prospect lay before me!' I arrived in Augusta; and when I saw cotton waggons in Broad-street, I whistled! but said nothing!!! But this was not all; there was more than a dozen tow boats in the river, with more than a thousand bales of cotton on each; and several steamboats with still more. And you must know, that they have cotton warehouses there covering whole squares, all full of cotton; and some of the knowing ones told me, that there were then in the place from 40,000 to 50,000 bales. And Hamburg (as a negro said) was worsed, according to its size; for it puzzled me to tell which was the largest, the piles of cotton or the houses. I now left Augusta and overtook hordes of cotton planters from North Carolina, South Carolina, and Georgia, with large gangs of negroes, bound to Alabama, Mississippi and Louisiana; 'where the cotton land is not worn out.' . . .

I continued my journey passing cotton fields; till I arrived at Holt's Ferry, on the Oconee, where I saw three large pole boats loaded with bales of cotton, twelve tier in height. From thence I went to Milledgeville, where I found the prevailing topic of the place, 'what an infernal shame it was, that such a quantity of virgin cotton land should be suffered to remain in the possession of the infernal Creek Indians.' . . . I moved on to the westward, crossing Flint River, and from thence to the Chattahoochie found cotton land speculators thicker than locusts in Egypt. But from Line Creek to Montgomery (14 miles) the land is nearly level; the fields of one plantation joining by a fence those of another; and all extend-

ing back from the road farther than you can distinctly see; and the cotton pretty even, and about as high as the fences, and has the appearance (as Riley says of Zahara) of a complete horizon of cotton. They have, almost all of them, over-planted; and had not more than one-half their cotton picked in; each plantation has a cotton gin. I next came to Montgomery, which I found over stocked with cotton, and no boats to take it away. From Montgomery I went to Blakely, and on my way, saw many cotton plantations, and met, and over-took, nearly one hundred cotton waggons, traveling over a road so bad, that a State Prisoner could hardly walk through it to make his escape. And although people say that Blakely is done over, there was not a little cotton in it. From there I crossed over to Mobile, in a small steam boat loaded up to the top of the smoke-pipe with cotton. This place is a receptacle monstrous for the article. Look which way you will you see it; and see it moving; keel boats, steam boats, ships, brigs, schooners, wharves, stores, and press-houses, all appeared to be full.

And so the story runs on with descriptions of similar conditions prevailing in all of the western cotton belt.

This tremendous activity led at times to the spoiling of the market. In 1839, for example, there was a great fall in cotton prices, and a fearful panic throughout the belt, which entailed severe depression for half the following decade. Then the world's demand gradually gained once more upon the supply, and the price rose by 1850 to ten or eleven cents where it remained fairly steady for ten years of prosperity. Ten cents in that period was in general purchasing power equivalent to about fourteen or fifteen cents at the present day. The hard times of the forties were forgotten, and cotton was again enthroned as king without any rival pretending to share the devotion of his subjects. This mighty king was expected to render overwhelming aid in the war of the sixties and secure victory for the South in its battle against the world. The outcome is notorious.

After the war cotton was for a decade or two of necessity again the chief reliance in Southern industry. And again the old habit of complete dependence upon the staple tended to grow in strength. The low prices in the nineties checked that tendency for the time, and promoted some diversification of industry; but the high prices of 1902-4 have revived the mania, and now the fact is emphasized that, as of old, the South is securing relatively little advantage from its natural and unique source of wealth. While cotton prices are low and tend to remain very near the cost of production, the cotton producers continue to be obliged to pay abnormally high rates for most of their supplies, and through the protective tariff and the pension policy of the United States Government, the South must continue to pay its enormous annual tribute to the sections which control the Federal Government. There is clearly a grave problem to be faced; and suggestions for its solution ought to receive consideration, even when they contemplate a radical departure from current practice.

II

The American cotton belt has a combination of advantages for cotton production which is unequalled in any other part of the world; and the American output in its relation to the world's demand is by far the greatest factor in fixing prices in the world's market. That is to say, the South has, within limits, a potential

monopoly of the product. Among its advantages are: 1. A very broad expanse of territory, and the best climate in the world for cotton production, a warm and extended growing season with a specially long and fine autumn for the harvest. And it has plenty of rainfall for cotton culture, which renders costly irrigation unnecessary. 2. It has cheap labor in large amount. This is needed in economical cotton production, because the gathering of the crop is too tedious to justify the employment of high-priced labor. 3. It has an efficient managing class. These expert plantation managers are essential in maintaining a system of organized industry and for the utilization of the cheap labor, which would otherwise be costly on account of the ignorance and unreliability of the Negroes. This combination is unparalleled in the world; and in spite of the efforts of European governments for the past half century to promote cotton culture in Asia and Africa, it appears highly probable that North America will continue for a long time to control the cotton supply. There are many districts in the world which could make large amounts of cotton at a cost of, say, fifty cents a pound; but very few indeed can produce more than they now produce at less than twenty cents. And below that price the only severe competition which an American cotton producer need fear is that of the other American cotton planters.

The American cotton growers alone can spoil their market; but *they* can do it with the greatest ease; they have done it in many seasons gone by, and bid fair to continue indefinitely in the same practice. Let us see why this is so.

A very important feature in the situation is the fact that the world's demand for cotton is much less elastic than the supply. People want about as many clothes and ships as many sails one year as another: the demand for cotton, while constantly tending to increase, is relatively steady. But the supply fluctuates through a wide range. Not only does the acreage vary from year to year at the discretion of the planters, but the weather conditions, to which the crop is extremely sensitive, differ enormously, and not at all at the planters' will. The fact that three-fourths of the world's total market supply is grown in one geographic province intensifies the importance of the weather and increases the variability of the output. The demand being fairly steady and the supply quite variable, the market is nearly always either undersupplied or oversupplied. A normal relation is very hard to maintain, and a normal price is a thing in the realm of pure conjecture. The price has ranged all the way from four cents to a dollar a pound and back again in the last seventy years; and it has played between six and a half and seventeen cents within the last twelve months.

These considerations bring out the fact that cotton production is in very large degree a speculative enterprise: it has many of the features of a lottery. And by its influence through a long period of time it has fostered a headlong plunging disposition among the people. By offering alluring promise of high profits if the local crops be good and the general prices high, it obscures the more probable prospect of very moderate gains or positive losses. In this way there is exerted a constant tendency toward the production of too great a supply of

cotton, which ruins the market and diminishes or destroys the legitimate profits of the planter. This keeps the planters poor and keeps the whole community poverty-stricken along with them. And, what is quite as bad, it makes the income of the community extremely uneven and uncertain from year to year. Fickleness of income, whether with individuals or great bodies of men, is a most demoralizing factor, promoting a disposition to squander the resources in hand and let the morrow take care of itself. When men cannot reckon what next year will probably bring, they naturally cease to plan that far ahead, and the happy-go-lucky disposition must prevail. A certain degree of stability is essential for the promotion of thrift, sobriety and foresight. Fickleness in the returns from one industry must be pernicious wherever it is not offset by the development of other resources on a scale correspondingly large. It thus appears that if the world should make efficient demand for all the cotton the South could produce, it would not be wholesome for the cotton belt to devote its whole energy to raw cotton.

But the world does not demand as much raw cotton as the American producers can supply. The world's demand is too small to justify the employment of all the cotton-belt land and labor in the one industry. In last analysis the cotton problem is a labor problem, and the special need for Southern prosperity is the need of keeping the surplus labor out of the cotton fields. To secure a long succession of fat years this surplus labor must be invited out, if the invitation be effective; driven out, if compulsion be necessary. The pressing need is that of other attractions with satisfactory remuneration for labor. We should not hold fast blindly to ancient custom, but seek throughout the world for advantageous ideas and apply them to Southern needs. When used as a special advantage, cotton is a splendid resource, but as a sole reliance it brings the people more injury than good. The fundamental problem is to raise other enterprises, great and small, to an equal or higher level than that of cotton production in their attractiveness to labor, and thus secure the double benefit of adding new resources and at the same time checking the cotton output and increasing the remuneration therefrom.

It is hardly necessary to enlarge upon the advantages to accrue from the diversification of industry, and especially the development of manufactures. The excellent conditions which now prevail in and around the manufacturing centers which have already arisen, and the effect of that movement in raising cotton prices in the past few years are sufficiently convincing object lessons.

But this movement should not be checked, as it now threatens to be, by the fresh competition of the cotton fields in the demand for labor. Numerous mills in the South are now reporting a portion of their looms and spindles idle from a dearth of operatives. The benefits are cumulative, i.e., the larger and more numerous the manufacturing towns, the greater the demand for truck and dairy supplies and the fruits of varied industries; the better the opportunity for educational improvement, and the better the opening for progressive spirit. And, by the way, an increase in general comfort and enlightenment must needs bring

a lessening of race friction and crime, for when there's plenty of good things to go around, people are not prone to quarrel.

Is this utopian condition possible of achievement and how? It is suggested in various quarters (by men whose memories are short) that the banks in the cotton belt be organized into a cotton-holding trust and thus drive prices up. But that very project was tried in 1837-9 with the most disastrous results. A somewhat more hopeful method is urged by the Cotton Growers' Association, recently organized, which is holding meetings in many counties, at which the growers resolve to keep their remaining bales off the market and reduce their acreage for the coming year. This may now achieve more success than a similar effort in the nineties, but its effect can be no more than temporary. Men cannot be deterred from following the most inviting and accustomed paths by mere persuasion, unless new openings be made which promise to be equally or more inviting. Industrial experiments and education ought to and doubtless will in the long run promote the diversification of industry and the improvement of the general welfare, but without some special stimulus that work promises to be slow in the South.

These are the well-worn remedies, discussed with vigor from time to time for many years past, and thus far with little but spasmodic result. If the current of progress in the Saxon race in general be likened to the flow of a mighty river, that of the plantation States of America may perhaps be compared to the surge and recession of the waves on the seashore—advance from time to time, but little genuine progress. If at first sight this appears unfair, let a comparison be made of the status of things at the present time with that in the days of William Byrd and Alexander Spotswood, or of George Washington, James Wright, and the Lowndes and the Pinckneys, or of Wade Hampton, George Troup, Thomas Dabney and their contemporaries of the ante-bellum cotton régime. This relative lack of progress in the South may perhaps be explained without discredit to the South. But explanation and justification are not satisfying when progress is demanded, when a remedy for depression is the need of the times, and a preventive of hard times the need of the future.

In economic concerns no man may remold conditions at will, nor prophesy developments with much accuracy or confidence, but in view of the general needs of the Southern situation and the inefficacy of time-honored methods, a new suggestion which may serve as a thesis to attract criticism and arouse thought may be well in place. Let us therefore consider the advisability of a tax on cotton production and a bounty on cotton manufactures and other industries of promise in the cotton-growing States.

III

To oversupply the market is easily accomplished by the American cotton producers. In fact it is only through voluntary restraint that oversupply is to be avoided. Land is superabundant, the weather can be counted on when a succession of years is under consideration, and there is more labor at hand

than the world demands at a remunerative price in the cotton fields. But if cotton is superficially too attractive to labor, some recourse ought to be found by which to offset this superficial attraction by more substantial ones in other directions. The great problem is that of deterring the surplus labor from joining the rush and bringing general distress.

If no more than enough labor is devoted to cotton, the producers and the country get the benefit of monopoly prices. But if too much labor be employed, the monopoly is ruined and hardly anybody is benefited but the consumers, and they in an infinitesimal degree.

With firm resolution and concerted action it would appear possible for the State governments of the cotton belt to *protect* the cotton-raising industry from cut-throat competition by taxing its product, and to promote other industries at the same time by devoting to their aid the proceeds of the cotton tax. It is one of the very obvious, though paradoxical, truths of finance that a tax on mortgages does not fall on the holders of the mortgages, but through a raising of the rate of interest it is shifted upon the borrowers. Likewise a tax on a monopolized commodity would in the average case, by decreasing the output, raise the price so that the producer would in the long run be relieved of all the burden of the tax and even probably receive an actual surplus income considerably greater than the amount of that tax.

Imagine for a moment, as a somewhat radical application of the policy, that all the governments of the cotton States had recently imposed a tax of one cent per pound on all cotton hereafter raised and ginned in those States, and at the same time offered a large part of the proceeds of that tax as a bounty upon certain other selected industries, and let it be understood by the people that the purpose of the measure was the reduction of the acreage, as a patriotic enterprise, and the promotion of the general welfare. It is not unreasonable to suppose that such enactment would cause the withdrawal of, say, 20 percent of the labor from the cotton fields which would otherwise be employed therein. The 20 percent decrease in the labor would probably cause a reduction of about 20 percent in the output. Reckoning from the course of past fluctuations a decrease of 20 percent in the output would cause an increase in prices of much more than 20 percent; perhaps as much as 40 or 60 percent. This would of course mean a handsome increase in the net profits of the cotton producers. And by means of the tax and bounty system this benefit would at once be distributed throughout the whole community. Meanwhile the laborers withdrawn from cotton production because of this measure would be profitably employed in other industries; and the product of their labor would be in large part an additional clear gain to the commonwealth. Let this be kept up for a number of years, and the cotton belt might well experience a gradual revolution in industry by which cotton growing would become merely one of several great industrial resources and would rank as a unique and splendid advantage bringing great wealth, instead of a sole reliance, and a poor one, for keeping the wolf from the door.

For beneficial results, indeed, it would probably not be necessary to unite all the cotton States in this policy. If only a few of the greater ones acted in accord (upon the advice, we will say, of a joint commission) the benefits would still be great. A reduction of 20 percent in acreage in three or four of the large cotton States would decrease the total American output by half that percentage and would raise the price materially. At the same time the use of the proceeds of the tax, in promoting manufactures, etc., in those States would substantially increase the resources and wealth of their people. And even if a single great cotton State tried the plan without the cooperation of its sisters, the hope of benefit from the diversification of industry and the increase of resources would not be unreasonable.

The simplest method of administration would be to levy the tax at the ginneries, and offer a drawback of the full amount of the tax as bounty to any factory in the State upon its presenting evidence of having worked up into cloth the bales upon which the tax had been paid. It might be a wholesome modification to give the full drawback only to new mills, say for the first ten years of their operation, and reduce the bounty given the old mills to one-half the rate of the tax collected. If it be feared that a tax of one cent a pound would cause too great a disturbance of industry, a lower rate of tax might well be adopted instead. After the payment of the bounty on cotton manufactures, the surplus proceeds of the tax might be advantageously devoted to bounties upon the manufacture of furniture, the raising of hay and cattle, and upon other industries which give promise of successful development under such a stimulus. And a large part of it could be devoted with excellent results to the improvement of education and other great public purposes.

But whether this specific remedy of tax and bounties be applied is a minor consideration. The essential need is by some means or other to diversify industry in the South and counteract the tendency to spoil the cotton market by overproduction. And the present epoch, while the people are freed from debt through the virtue of short cotton crops, and are their own masters,—the present is the time for study and action leading to the end in view. We have had enough depression this year to emphasize the need of preparing in fat years for the lean ones which are liable to follow; and the lesson should be eagerly acted upon.

Let us keep on building factories, and take away all the profit we can from the outside districts, which are parasites upon the South, and let us plant more orchards and vineyards and broad fields of varied crops; let us raise the best sorts of grasses and forage crops, and cover the land with lowing herds and thrifty creameries. In a word, let us follow the example of England, with her wool; France, with her wine, and New England, with her fisheries, and make use of our staple product as a special advantage through which to secure wealth for a complete and rounded and self-reliant industrial system. Such must be our objective; the ways and means of reaching it must be an ever-present problem.

NEWS NOTES AND COMMENTS

CONTRIBUTORS

Dr. B. I. Wiley ("Salient Changes in Southern Agriculture since the Civil War") is head of the history department of the University of Mississippi. He is a graduate of Asbury College (B.A., 1928), the University of Kentucky (M.A., 1929), and Yale University (Ph.D., 1933), and the author of *Southern Negroes, 1861-1865* (New Haven, 1938), a work which was awarded the Mrs. Simon Baruch Prize by the United Daughters of the Confederacy in 1935.

Dr. Joseph W. Ellison ("The Cooperative Movement in the Oregon Apple Industry, 1910-1929") is professor of history at Oregon State College, Corvallis. For further details, see *ante*, 11:254 (October 1937).

Dr. Roy M. Robbins ("The Public Domain in the Era of Exploitation, 1862-1901") is professor of history at Butler University, Indianapolis. For further details, see *ante*, 7:2 (January 1933).

Dr. Donald D. Brand ("The Origin and Early Distribution of New World Cultivated Plants") is head of the department of anthropology at the University of New Mexico, Albuquerque, and a leader in the utilization of the research methods which his present article describes.

DECEMBER MEETING OF THE AGRICULTURAL HISTORY SOCIETY

The Agricultural History Society met concurrently with the American Historical Association and other historical societies at Chicago on December 28, 29, and 30, 1938. The joint literary session of the Agricultural History Society on Wednesday afternoon, December 28, was devoted to the following papers: A Study of the Origin and Early Distribution of New World Cultivated Plants, by Professor Donald D. Brand of the University of New Mexico; The Rise of the Dakota Spring Wheat Area, 1860-1890, by Professor Marc M. Cleworth of Northern State Teachers College, Aber-

deen, South Dakota; and Barnett A. Barrows: Typical Ante-Bellum Planter of the Felicians, by Dr. Edwin A. Davis of Louisiana State University. Professor Wendell H. Stephenson of Louisiana State University acted as chairman of the session, and about seventy-five were in attendance. At the luncheon sponsored by the Agricultural History Society on Thursday, December 29, Professor B. I. Wiley of the University of Mississippi presented an address on "Salient Changes in Southern Agriculture since the Civil War." The Honorable Frank O. Lowden who was scheduled to address the guests on "Changes in American Agriculture in My Lifetime" was unable to be present because of the severity of the weather and his advanced years. It is hoped that a printed text of his observations can eventually be secured for the readers of *Agricultural History*. About one hundred and fifty attended the luncheon, and Dr. Russell H. Anderson, the Society's president, presided.

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A NATIONAL AGRICULTURAL CENTER AS A FOCAL POINT

RUSSELL H. ANDERSON

We are all familiar with the fact that agriculture was the original basic industry of our country.¹ To be sure, some of the early settlers came with visions of gold and others were primarily interested in the fur trade, but very soon agriculture became the dominant occupation and way of life. It satisfied our most urgent needs for food and clothing and, as a kind of byproduct, for shelter as well. It controlled our activities by and large from the early days of settlement, and dominated our thinking. The life of the South, an important factor in our early national life, was based almost exclusively upon the soil. The Middle States, although interested in industry and commerce, were essentially rural in their thinking in the early days, and even New England, with its fishing and shipping, lived close to the soil. The formation of our early national government showed evidences of an agricultural rather than an industrial society.

With age, the situation changed somewhat in the Northeast, but as it did so New Englanders and New Yorkers pushed on to the West by way of the Erie Canal, and Pennsylvanians went over the mountains and down the Ohio or joined in the trek down the valleys and out onto the Southern upland. To the consternation of the New England shippers, the West, which had been the home of the War Hawks of 1812, became the object of much attention and an ally to be sought. Never was a maiden wooed more assiduously than this rising West, a section thoroughly agricultural in its economic interests and thinking.

One might go on at length and describe the waves of economic development which swept across the country. As agriculture drifted westward, the tiring soils of the East were replaced by new land in the West. By this means and by the improvement of machinery, plants, fertilizers, livestock, and transportation, these soil losses were obscured, yields were maintained, and the total output greatly increased. These factors enabled the per capita output to increase materially, so much so that whereas it required perhaps 90 percent of our population to feed and clothe us in 1790, by 1930 less than 40 percent lived on farms and yet were able to raise a surplus which caused great concern. Of course, it is impossible to make a direct comparison due to a lack of statistics and the changing circumstances of manufacturing.

As a majority industry which was widely diffused throughout the country, agriculture was close to the lives of all and understood by all. As time went on and an increasing number of people turned to the growing cities, the influence and control which agriculture had exercised over our national economy began to weaken, and the farmer found himself at an increasing disadvantage. As his position approached that of a minority status, he began to form organizations

¹ The presidential address at the annual meeting of the Agricultural History Society in Washington, D. C., on May 24, 1939.

whose most frequent underlying purpose was to regain, by control over railroad rates, currency, etc., the position which was slipping away. Since late in the nineteenth century agriculture in the United States has been a minority industry, albeit of great importance, and it will, in all probability, continue in that rôle. In our country, agriculture has a noble past, of which we can all be proud, and a present replete with problems and accomplishments of the utmost importance to all. We wish to have the general public appreciate that background and understand what needs to be done today and what our Department of Agriculture and private interests have accomplished. It is of consequence, therefore, that agriculture have a focal point to coordinate and present its case in all its aspects. A hall of agriculture developed as a national agricultural center would supply such a focal point for the industry.

Various organizations relating to agriculture have an interest in presenting this proposal. The Agricultural History Society feels honored to have a hand in advocating a hall of agriculture, with a museum of American agriculture and a headquarters for the Nation's agricultural interests. We have three large farm organizations which are striving to improve the situation of the industry. They vary somewhat in the geographical distribution of their membership and in their points of view, but they are all working toward the same end. Such a hall of agriculture could serve a most useful purpose in providing them with a common headquarters in our national capital. Perhaps with a closer coordination their differences might lessen and their common ground increase, and they would undoubtedly profit by a closer association with each other and with the other phases of this enterprise. Other farm organizations of importance, such as the American Farm Economic Association, the 4-H clubs, and the Future Farmers of America, might well join this agricultural center so that the hall could be a gathering place of agricultural folk interested in promoting their chosen industry and way of life.

As a definite means of reaching the public and telling the story in which we are all interested, a museum of agriculture should certainly be instituted as an important feature of this project. This museum should have two aspects, the historical and the currently descriptive and scientific. In its historical aspects, it should have two distinct purposes—to increase our appreciation of the past by showing how our fathers won a competence from raw nature; and to point the way to the solution of our current problems through consideration of our past failures and successes.

This museum should be in keeping with the new thought in the museum world—a live dynamic museum and not a mere depository or reliquary, such as the word once implied. Relics have their use—a real use—but merely as relics they are sterile. To be of real use they must serve as illustrative material in a connected story. I have in mind a very fine collection which fails as a museum because it is an overcrowded depository in which the items are not allowed to tell their story effectively. Within the range covered by its collections, two museums could be outfitted from it to the benefit of both.

Isolated factors, facts, or tools in a museum are like isolated facts in history in general—of interest on occasion but of little real consequence. The important thing is not the machine itself, or the process which is employed, but the trend of events, the causes, relationships, and consequences. Solon Robinson's mention of soil erosion in Georgia in 1851 is of interest in itself, but it takes on great significance when considered with similar situations elsewhere in the section and with his insistence upon a remedy which has since proved so effective, namely, terracing.

In this connection, it might be well to point out an analogy between a museum and a book. If we group our information into relatively small units and arrange them haphazardly, we have a useless jumble. If we arrange the items alphabetically, we have a reference work like a dictionary or an encyclopedia. Such a book is very useful, but seldom to be recommended for general reading or to bring out a thesis. If our purpose is to tell a connected story, we will select the material more rigidly and we will certainly organize it differently. We will select those facts which are pertinent to our thesis and we will arrange these facts in a logical way, by paragraphs and by chapters, to accomplish our purpose. Such a book will speak with effect.

A museum which is made up of isolated units without arrangement can hardly lay any claim to the title. If it is arranged topically, it may be compared with the reference work. It is a study museum, quite a proper thing from some points of view, whose usefulness depends upon its materials, and their arrangement, and upon the clientele to which it may appeal. If our museum is to be likened to the systematic orderly book which tells a unified story, it must be organized for the purpose. Truths must prevail, but the organization of those truths must be in logical sequence, even though some possible subjects must be eliminated. It is necessary to decide upon the points which it is essential to make and then hew to the line, let the exhibits fall where they may. It is necessary to draw a line and be ruthless in excluding extraneous material. Fortunately, walls set limits, and visitors, who are under no compulsion to look at exhibits, serve as checks on what may be done. I sometimes think it would do college professors much good if they had to put their subjects in a museum. The courses which would result would doubtless be more logical and significant and free from a lot of dead wood.

Along with the necessity of arrangement goes the importance of emphasis. No orator makes all his points with equal force, no good book follows a monotonous cadence, and no good museum gives equal prominence to all exhibits. The more important of the selected subjects must be given emphasis. It may be by location, by size, by light or color, by action, or by other means, but the accent must be made. This is necessary, not only to leave the proper impression in the visitor's mind, but to induce him to follow the story in the first place. A museum without emphasis, like a speech without its climax or a book without its high points, fails to a considerable degree in attaining its objectives.

Such a museum must be highly selective. It can not include everything—

State pride and States' rights preclude enlarging the District of Columbia. Both from the standpoint of expense—good museum space costs from \$10 to \$20 per square foot—and of securing and holding the interest of the visitor (and lacking that all reason for being ceases), it is necessary to stress the important points and omit non-essentials. Otherwise, salient points will be omitted and the forest will be obscured by the trees.

As has often been pointed out, agriculture is more than an industry—it is a way of life. The tobacco plantation of Virginia, the rice plantation of South Carolina, and the cotton plantation of Georgia represented a system of farming, a social organization, and a philosophy of life which was of tremendous importance to our political as well as economic life. Perhaps the views of the New England farmer on his "macadamized" farm or the back-country farmer at the time of the Revolution were as much influenced by their surroundings as the ante-bellum Southern planter, the Middle Western farmer at the time of the Civil War, or the rancher of the West in the '80s.

This museum which we contemplate should cover the principal regions of the country, historically, by order of settlement, stages of agriculture, and types of farming, and currently by major interests, as in the case of the cotton and the corn belts. For the regions, it should show the mode of life, the soil, the flora, the crops, the tools, and the transportation. It should show the state of the land at the time of settlement, its uses, and its abuses (such as the farming of lands suited only for forests and the plowing up of land which needs a continuous sod) which have resulted in erosion, decreased income, and a lower standard of living. Furthermore, the story would not be complete if it did not emphasize the proper use and techniques necessary to restore the land and produce a balanced agriculture. In telling such a story as I have outlined, this proposed museum, a national agricultural center and exposition of agriculture, would have the advantage of expert assistance, such as is undreamed of in any museum of the world today. As a part of our governmental organization, it could command the cooperation and assistance of our expert personnel, both here and abroad.

The time was when life was so simple that the citizen and his growing children could see the whole range of production on the farms and in the shops about him, in the water-driven grist mill, the local forge, the shoemaker's shop, and similar places. No longer is this true. Milk now comes in glass bottles (or paper tubes), shoes come off shelves, and bread (which moderns may recognize as having something to do with flour) comes from the grocery or delicatessen. Back of the production of these products is an industrial and commercial organization which is complex, processes which are intricate and obscure, and machines which are no longer just inside the village smithy's door. Industry has seen the necessity of explaining itself to the public; and the Museum of Science and Industry in Chicago, the similar institution in New York City, and the Franklin Institute in Philadelphia have been set up to interpret our complex industrial life and processes. Well and good, but only the museum at Chicago

has attempted to deal extensively with agriculture and that, of course, is not available in Washington. If agriculture is to hold its own in the estimation of the public, it too must have not only its past but its present explained.

What is agriculture doing today that our citizens should know about? Here I refer not only to what is being done by the Department of Agriculture, but by farmers, stock and plant breeders, agricultural colleges and experiment stations, mills, and other individuals and agencies as well. To illustrate, let us note a few examples.

Just now hybrid corn is a headliner of great significance. What is hybrid corn and what is its scientific explanation? What is being done with it, what is its future, and what benefits arise therefrom? What are the problems confronting the mechanical cotton picker, its engineering difficulties, its relation to plant breeding, its social consequences? Soil conservation—particularly the erosion aspect—is much in our minds today. In presenting this problem we can draw upon the past, both here and abroad, as well as point out its seriousness and what can be done, and is being done, to overcome it. The soybean crop with its phenomenal and continuing growth is of prime importance. Its improvement and future uses are the subject of profound research, particularly at the regional laboratory at Urbana, Illinois. Recent drought and dust storms have made us more fully aware than ever before of the importance of our grasses and of our lack of information about them. These, and many other subjects which will readily occur, are in need of exposition. It would be ridiculous, of course, to imply that our Department of Agriculture, colleges, extension agencies, farm organizations, and press are not busily and successfully engaged in giving the farmer information about the latest scientific developments and also in bringing the news of them to the city dweller as well. But there is need for other avenues which will supplement those now in use, particularly by providing a simple, three-dimensional story which all may see and ponder. Nor should we think of this museum as being confined to Washington. You can not move a museum around, but you can take advantage of such exhibits to publicize in a new way the problems of the moment.

Then, too, this museum should be the central agency in coordinating the work of agricultural museums or agricultural departments of other museums throughout the country. Perhaps something similar to the trailside museums of our National Park Service might be instituted. Many of our agricultural colleges, State departments of agriculture, and civic and trade bodies would welcome suggestions and assistance. Many of the smaller museums have farm and household tools and appliances which could be more effectively exhibited. At the Museum of Science and Industry in Chicago we receive occasional requests for suggestions for improving such displays.

It is one thing to know a historical or scientific story and another to be able to tell it in terms of the layman. Some can discern the significant line of truth and realize the importance and interest of its component parts to the public, but all too frequently those who are most thoroughly acquainted with the intri-

cacies of a subject find difficulty in leading the layman through it. Rare is the man and fortunate is the institution which commands his services, who can digest a topic, select its significant points, and tell it in the layman's language. Furthermore, it must be recognized that, however much we may specialize in our own field, we are all laymen in practically all fields of knowledge. And after all, it is the layman we must reach or the reason for the museum ceases to exist. A good story told to no one is useless, indeed. One must always view a museum as a teaching institution, a kind of extracurricular school, and pupils are very necessary for its functioning.

Many of those present, especially those who live in Washington, have felt the need for an exposition of the agriculture of America, particularly when visitors come from abroad and ask for a summary of our agricultural industry, of which they have heard so much. With all we are doing through governmental and private agencies, we can present no such view—even in printed form. Where is such a need greater than here and where can it be better satisfied? On occasion we spend large sums on exhibits in expositions at home and abroad to portray our greatness. Would it not be more logical to present a permanent display of our agriculture for the enlightenment of our citizens who visit the capital every year and for the benefit of foreign visitors?

The subject matter of such a display would be varied and would include sections throughout the museum, but I have in mind one item in particular. Suppose in a covered court of such a museum we had a giant relief map of our country over which we might move and inspect, as from an airplane, the panorama of mountains, plains, and valleys. We could visualize the coastal plains, the broad river valleys, the high plains, the irrigated sections, and the forests. We could see the soil types which determine much of our agriculture, the rainfall pattern upon which our crops depend, and the transportation factors involved. On such a map, directly or by projection, we could see the distribution of our agricultural products, their amounts and proportions, their methods of harvesting, and their ultimate destination. Around and about such a map could be placed the products and their derivatives, and a pictorial survey of present-day agriculture to round out the story. Armed with the information which such an ensemble could give, the visitor could go forth prepared to see and understand.

Such an institution as we envision must be alert and make full use of the multitudinous devices available to the museum today. The diorama, which is in fact quite old, has had great prominence during the recent and continuing outbreak of world's fairs and has been overdone, I fear, but it still remains the best means of portraying the ensemble of life on the cattle ranch, the pioneer farm, or the Southern plantation, for examples. The full-size figure, the machine, and the model, preferably operable, will readily occur to all. The live plant, the motion picture, the photograph, the chart, the diagram, the X-ray, the stroboscope, and the demonstration must all be used to tell the story. I might here inject the thought that if we were not so immersed in our own little

compartment we might find in far distant fields new materials, techniques, and concepts which would serve us well.

One of the most effective types of museum exhibit is that which can be placed outdoors in its natural setting, and it should not be overlooked. The fence, the threshing machine, the grist mill, the ash hopper, and the pioneer cabin with its many unique furnishings are cases in point. Effects can be secured outdoors which are difficult, if not impossible, to achieve indoors.

What would be more effective, and incidentally more satisfying to build, than a reconstruction of the Georgia plantation where Eli Whitney invented the cotton gin? Here the tools, the buildings, and the crops, as well as the general manner of life, could be shown as no indoor museum can hope to do.

The Department of Agriculture has long carried on exhibits work, but the men connected with this kind of informational service will be the first to tell you that the limitations imposed upon them by the necessity of making the exhibits light and easily dismantled handicap them greatly. An agricultural museum in Washington would in no way do away with the exhibits work of the Department, but the materials and methods of such an institution might well be of real value to it.

A museum of American agriculture must be in sympathetic hands if it is to be of the highest service. By this I do not mean those who will gloss over agriculture's shortcomings and give an idyllic picture which is not justified, but those who are really interested in telling the story of agriculture. Perhaps there are few who would contend that agriculture should not be portrayed, but the difference between the attitude and actions of one who, on purely logical grounds, admits that agriculture is important and one who has a feeling for the subject and takes its philosophy, point of view, and basic facts in his stride, is too great to be measured in words. It is a difference which can be felt by anyone who is close to the problem, but which can not be easily expressed. It is for this reason that great care needs to be given to the organization of the proposed museum. The nature of the subject matter and the close cooperation required with the technical staff of the Department of Agriculture point very clearly to a close affiliation with that department. On the other hand, the necessity for rigorous selection of subject matter and careful preparation of exhibits for a general public, and for decision unhampered by outside pressure makes it highly desirable that the museum should be on its own feet. The directing head should, within the proper limits of a founding act and the requisite budgetary checks, be given the power of decision on subject matter and techniques. He should have the understanding, training, breadth of vision, and willingness to make decisions required to bring the matter to a successful conclusion. A great deal of the success of such a venture depends upon these considerations.

The question of this museum's relationship to and effect upon existing institutions in Washington will inevitably arise. If one gives thorough consideration to the matter, one need have no serious misgivings. No existing museum undertakes to cover the scope outlined for this project, and presumably none wishes

to do so. Its field would be so different, its techniques so foreign, and its objectives at such variance with existing museums that they could scarcely be thought of as competitive. For example, the Smithsonian Institution, harking from an earlier day and charged with certain responsibilities toward scientific research and toward technical evidence in its possession and now imbued with definite traditions, has obviously a somewhat different mission, and the two institutions need in no way conflict.

It is altogether proper that the Agricultural History Society should have a hand in promoting this necessary and worth while hall of agriculture. The history of agriculture is the breath of our professional existence. The Society, in its membership, brings to the subject a study of our past, its good points and its bad, its trends and its lessons. At the same time, it includes many who are active in modern scientific work, and all of our members have a keen appreciation of present-day achievements and problems. It has been a happy thought to devote this annual meeting to the consideration of so pertinent a proposition, and it is to be hoped and expected that we will go hand in hand with this project and do our part to secure and develop a hall of agriculture to serve as a national center and focal point for American agriculture.

Museum of Science and Industry
Chicago, Illinois

A NATIONAL MUSEUM OF AGRICULTURE; THE STORY OF A LOST ENDEAVOR¹

C. A. BROWNE

The establishment of a national museum of agriculture in the United States has been a subject of occasional discussion for nearly a hundred years. One of the first efforts to accomplish a realization of this project was the installation of the nucleus of a national gallery of scientific, agricultural, and industrial curiosities in the United States Patent Office in the early 1840's. Commissioner of Patents Henry L. Ellsworth began to issue annual reviews upon the crops and other agricultural resources of the United States in 1842, and many of the objects displayed in the National Gallery of exhibits of the Patent Office had an agricultural significance.

THE EARLY MUSEUM OF THE UNITED STATES DEPARTMENT OF AGRICULTURE

With the establishment of the United States Department of Agriculture in 1862, the need was immediately felt for a museum that would be distinctly and peculiarly agricultural. According to the plan outlined by Commissioner of Agriculture Isaac Newton in his first annual report to President Lincoln, dated January 1, 1863,

The museum would embrace models of all the most approved implements of husbandry; specimens of soils, rocks, &c.; samples of the various productions of the garden, field, and forest; varieties of grain in straw, and in sample, now generally cultivated or recently introduced into the country, with explanations respecting their soils, climates, weight, yield per acre, and their value as food. Here should be arranged specimens of the component parts of soils, manures, and all the products of agriculture, showing especially the values of different kinds of food. On the walls of this museum should hang the portraits of animals of the most celebrated breeds, and under its roof should be gathered whatever would tend to attract and instruct persons of the highest taste and education.²

The plan thus outlined is apparently the first printed synopsis for establishing a national agricultural museum in the United States. Acting in accordance with this idea Commissioner Newton announced the establishment of a departmental agricultural museum on August 1, 1864, with Townend Glover, the first entomologist of the Department, as curator. The selection was an admirable one, for Glover devoted such energy to his new duties that within a year he had amassed a large collection of insects, birds, animals, cereals, fibers, sirups, sugar, paper from farm wastes, wool, silk, and numerous other agricultural products. Glover stimulated farmers, naturalists, and teachers in the different States to assist him in his work of collecting. He also outlined a useful plan for making

¹ This address was presented and illustrated with lantern slides at a session of the annual meeting of the Agricultural History Society in Washington, D. C., on May 23, 1939.

² U. S. Department of Agriculture, *Annual Report*, 1862, p. 21.

the Department museum a distribution center to supply schools and societies with small agricultural collections as an incentive to study and research.

The two small rooms assigned to the Department of Agriculture for a museum in the old Patent Office building soon proved inadequate for housing the increasing accumulation of exhibit material. During his attendance at the Entomological Convention in Paris in 1865, Glover made a special point of visiting various European agricultural museums where he got many ideas for developing the Department's museum. His suggestions upon this subject were included in his report to the Commissioner of Agriculture for 1865.³

Upon the completion of its new building in 1868 (demolished in 1930), the Department of Agriculture was able to provide more extensive quarters for its rapidly growing museum. In the previous year it had been considerably increased by the purchase of Glover's large private entomological collection. Additions of agricultural exhibits were also acquired through a system of exchanges with foreign museums. Commissioner Horace Capron, in his report for 1868, stressed the purpose of making the museum not a mere collection of curious specimens but "a substantial foundation for a great national agricultural and economic repository of useful knowledge."⁴ The need of assisting the several States to establish agricultural museums of their own was also emphasized.

In the years following its transference to the new Department building, the collections of the agricultural museum were increased by gifts from individuals and by donations from the Smithsonian Institution, the Army Medical Museum, and other establishments. The museum also gained much benefit from the display of agricultural products which Glover arranged for the Philadelphia Centennial Exposition in 1876. These domestic exhibits afterwards reverted to the Department museum, and it also acquired, through the generosity of various exhibiting nations, a large collection of the agricultural products of different foreign countries. For the housing of this additional material, a gallery was constructed in the museum hall of the Department which increased the exhibit space from 5,000 to 8,000 square feet. A very full 30-page description of this "Economic Museum of Agriculture," with floor plans, was published by Glover in the 1877 report of the Department.⁵

A brief synopsis of the exhibits in the five sections of this museum will give an idea of its completeness. Section A, upon food substances, comprised exhibits relating to cereals and legumes; fruits and vegetables; farinaceous substances; sugar and sirups; beverages, liquors, and narcotics; spices, condiments, etc.; and aboriginal food substances. Section B, upon substances used in the arts and manufactures, comprised exhibits relating to textile fibers; paper materials; dyes and coloring materials; tanning materials; gums and resins; and fats, oils, wax, etc. Section C, upon natural history in relation to agriculture, comprised exhibits relating to animals; birds; and insects. Section D, upon botanical

³ *Ibid.*, 1865, p. 94-101.

⁴ *Ibid.*, 1868, p. 11.

⁵ *Ibid.*, 1877, p. 118-148.

series, comprised exhibits relating to forest woods; vegetable products; and carpological collections. Section E, upon miscellaneous collections, comprised exhibits relating to vegetable substances used in medicine; soils; fertilizers; farm implements; and casts illustrating diseases of farm animals.

While the products assembled were only the nucleus of the ultimate agricultural museum which Glover had in view, it can be said that the Department's "Economic Museum of Agriculture" at the time of his resignation in 1878 was the most complete of any that had been formed in the United States and compared favorably with many European museums of a similar type. A good beginning had been made and plans had been outlined for the future expansion of the museum with the purpose of making it a leading factor in the Department's work of research and education. It is, therefore, a matter of profound regret that, following the retirement of Glover who had been the moving spirit in the establishment of our first national museum of agriculture, this most promising feature of the Department's organization should have been allowed to languish from indifference and neglect. An additional factor in hastening the deterioration of the collection was its removal, owing to space requirements, from the main building of the Department into an ugly temporary wooden structure which had been erected as an emergency storehouse for housing various miscellaneous subordinate activities. While a nominal sum of \$1,000 was set aside annually for the upkeep of the museum, no further reference was made to it in the annual reports of the Secretaries until 1889 when Secretary of Agriculture Jeremiah M. Rusk announced:

I am making an effort to place the Museum on a broader basis, not so much in the line of curiosities, which will not be ignored, as in the exhibit of the agricultural products of this and other lands.⁶

Again in his report for 1890, Secretary Rusk emphasized the great need of expanding the facilities of the museum:

The educational, scientific, and historical interests which would be promoted by a distinctly agricultural museum of suitable character are too generally recognized to need urging at this time. It should be a matter of regret, however, that for the thousands who annually visit us from abroad, impressed in advance with the magnitude and diversity of our agricultural productions, we should have no permanent national collection fitly illustrating the products of our soil. The need of such a collection, moreover, is being keenly felt in investigations prosecuted by this Department, and involving important economic questions, the solution of which could be materially facilitated and hastened by access to the actual results of cereal growth attained under various conditions of soil, climate, and culture. . . .

A consideration of the wants of the Museum brings me to the question of adequate building facilities. The want of these is conspicuously illustrated by the unavoidable utilization of a huge, unsightly wooden structure, far inferior to many an exhibition building on a country fair ground, as an agricultural museum.⁷

⁶ *Ibid.*, 1889, p. 35.

⁷ *Ibid.*, 1890, p. 53-54.

Secretary Rusk's successor, J. Sterling Morton, in his report for 1894, described the inadequacy of the Department's museum building in the following words:

Pressure for space becoming greater from year to year, and adequate appropriations for the erection of substantial buildings having failed, the Department has been forced to erect cheap wooden structures upon the grounds. In such buildings is sheltered much valuable property. The Museum building cost about ten thousand dollars (\$10,000). A better building to burn could not be invented or constructed, and yet it contains a Museum which, on the market, is worth at least one hundred thousand dollars (\$100,000).⁸

This is the last official statement pertaining to the agricultural museum which appears in the annual reports of the Department. The wooden structure in which the exhibits were miserably housed was finally demolished in 1905 to make way for the erection of the East Wing of the present Department building. The exhibits deemed worthy of preservation were taken over by the various interested bureaus and the Smithsonian Institution. The national "Economic Museum of Agriculture," which had been the pride and hope of the early Department, thus became only a faint memory, the questions of its restoration and continuance being considered of too trivial a character in comparison with the other demands that were made upon the services of the rapidly growing Department.

While the United States thus went backward in the establishment of a national museum of agriculture, other nations went resolutely forward until now even the smallest of European countries have palatial museums of agriculture which are the wonder and admiration of the world. The remainder of this paper is devoted to brief descriptions of a few leading features of several of these European agricultural museums in order that we may better orient ourselves to the equipment and functions of these institutions in case we should ever again take up the national museum of agriculture movement that was suspended a half-century ago and which, notwithstanding the efforts of the late Dr. Frank Lamson-Scribner and others to revive it, still remains the story of a lost endeavor.

EUROPEAN AGRICULTURAL MUSEUMS

European agricultural museums fall into two main classes: the special museum which considers some special branch of agriculture such as horticulture, farm machinery, dairying, rural arts, and the like, and the general museum which treats of agriculture as a whole in all of its numerous divisions and interrelations. These special and general types of museum may in their turn be purely local in scope, considering the agriculture of only one district; they may be national, showing the agriculture of an entire country; or they may be international and present the agriculture of various parts of the world.

⁸ *Ibid.*, 1894, p. 63.

Museum of Economic Botany at Kew Gardens, London

One of the oldest, and in many respects most historic, agricultural museums in the world is the Museum of Economic Botany at the Royal Botanic Gardens at Kew, London. Four scattered buildings, located in a beautiful park of 288 acres, are used to display the economic products of the whole vegetable kingdom. The Kew museums are a highly specialized type of agricultural museum but are international in scope, the exhibits representing plant products from all parts of the world.

The botanical associations at Kew go back four hundred years to the time of Henry VIII when William Turner, the father of English botany, had his garden there, but it was not until 1759 that Kew began to develop as a place of botanical importance under the patronage of Princess Augusta, the mother of George III. Among the structures that date back to her time is the Orangery built in 1761 and now used at Kew as the Museum of Colonial and Foreign Timbers.

In 1840, Kew Gardens was made a national institution with Sir William Hooker as the first director. It was he who began the establishment of the different museums for illustrating the economic uses of plants and their value to mankind. The first of these museums, opened in 1848, was housed in an old building that had been used as a gardener's dwelling and storehouse. It was the first museum of its kind ever established and was the precursor of similar institutions in other countries. The building is the present Museum No. 2, which contains the economic plant products derived from monocotyledons and cryptogams, such as cereal crops, grasses, sugar cane, the hosts of tropical palms, ferns, mosses, lichens, mushrooms, seaweeds, and other flowerless plants. A complete catalog of all the exhibits in this and the other museums at Kew would fill hundreds of printed pages.

The old gardener's house in which this collection is placed is a veritable fire-trap. New large commodious museum buildings are greatly needed at Kew to replace the antiquated structures that long ago outgrew their usefulness. Yet, notwithstanding the inconvenience of overcrowding and the inadequate facilities of display, the student can obtain a better and more detailed picture of the economic uses of the plants and crops of the world in the Kew museums than in any other place.

Museum Building No. 1, with its beautiful surroundings of lake and trees, was opened to the public in 1857. It contains exhibits of plants and useful products derived from the immense class of dicotyledons. Many thousands of plant commodities, such as foods, beverages, drugs, dyestuffs, textiles, tanning materials, oils, waxes, essences, spices, gums, rubber, and other agricultural products from all parts of the world are exhibited here. Museum Building No. 3, formerly the residence of the Duke of Cambridge, contains the large collections of British forestry.

The great educational value of the Kew museums to the general public cannot be overestimated. In the arboretum, gardens, and greenhouses of this vast botanical institution, visitors can see many of the living plants whose eco-

nomie products are exhibited in the museums. In the physiological, anatomical, pathological, and other research laboratories at Kew, investigations of great agricultural importance are conducted, the studies of which are facilitated by a great library and extensive herbaria. The introduction of new plants of economic importance to the British colonies, such as the cinchona, or quinine tree, to India and the Para rubber tree to the Malay Peninsula, has been another part of the very valuable work accomplished at Kew. There is also a school for the training of gardeners and horticulturists.

Museum of the Imperial Institute of Great Britain, London

Another type of agricultural museum, the Museum of the Imperial Institute of Great Britain in London, serves as a commercial clearing house of information for all the agricultural products of industrial importance in the British Empire. In the extensive museum of this Institute commodities from over thirty British colonies are exhibited. The exhibits comprise the immense class of vegetable and animal foods; the various plant materials used for making beverages, such as tea, coffee, and cacao; cotton, hemp, jute, wool, and other fibers; all the different vegetable oils and essences; cloves, nutmegs, ginger, and other spices; and starches, drugs, tanning materials, and other products of almost infinite variety. The production of raw agricultural materials and their utilization in countless ways are illustrated not only by cased exhibits but by photographs, dioramas, transparencies, models, and charts.

Chemical laboratories attached to the museum analyze new raw materials of promising economic importance from the different colonies and establish contacts with industries that might be interested in their utilization. The public is instructed not only by the exhibits but by lectures, radio, and moving pictures, while schools and colleges are provided at small cost with samples and photographs. The quarterly bulletin of the Institute publishes valuable information regarding its scientific investigations.

The Colonial Institute of the Netherlands, Amsterdam

A work similar to that of the Imperial Institute of Great Britain is performed by the Colonial Institute of the Netherlands, which is the national clearing house of scientific and industrial information pertaining to the raw materials of the Dutch colonies. The architectural ornamentation of the Institute is most appropriate, while the interior decorations of marble and beautiful woods make this one of the most palatial museums in the world. The exhibits are carefully arranged about a well-lighted central court in cases containing tropical crops and their products, such as sugar cane, rice, cassava, coconuts, kapok, jute, palm oil, coffee, tea, cacao, tobacco, and the numerous plants that produce rubber, spices, drugs, resins, gums, essences, and other products. In addition to its fixed display of exhibit material the Institute prepares small cabinets of colonial products for use in schools.

The museum of the Colonial Institute at Amsterdam is splendidly equipped with all the varied devices of presentation, such as lecture rooms, illuminated maps, models, dioramas, transparencies, and moving-picture stereopticons for the use of children. In the chemical laboratories attached to the museum analyses of soils and agricultural products are made. A large library and reading room provide additional conveniences for the staff of scientists.

Museum of the Conservatory of Arts and Crafts, Paris

Another agricultural museum of a very different type is that of the Conservatory of Arts and Crafts in Paris. It is located partly in the old secularized Franciscan Priory of St. Martin-des-Champs, some parts of which date back to the twelfth century. The Conservatory museum is devoted especially to science and technology, and it probably contains the largest collection of models of agricultural machinery and equipment in the world. As a complete display of full-size farm machinery would require an enormous building, harvesters, threshing machines, manure spreaders, wagons, and other bulky equipment are represented by well-executed models. In addition to conservation of space, models also have the advantage of giving the visitor a better perspective of the different stages in the development of a particular machine. These models not only represent every conceivable type of portable farm machinery, but they also illustrate large fixed installations such as silos, vacuum pans, evaporators, fermenting vats, rectifying columns, and other built-in equipment of plantation sugar houses, distilleries, starch factories, and the like. An immense variety of farm tools, such as shovels, sickles, pruning hooks, and scores of other small implements, are exhibited in their original form at the Conservatory museum. The collection of dozens of different types of horseshoes is a good illustration of the detail with which every subject is treated.

Besides models of mechanical farm equipment, the Conservatory has an immense collection of colored plastic duplications of many varieties of apples, pears, peaches, plums, and other native fruits. It has also a vast assortment of water colors, drawings, and photographs of different breeds of farm animals. Pictures of operations related to agronomy, horticulture, dairying, agriculture, and the other numerous phases of diversified agriculture are also exhibited.

Attached to the museum of the Conservatory is a large technological library, located in the beautiful thirteenth-century refectory of the old priory. If the monks who dined there six hundred years ago could return, they would be surprised to note the changes that had occurred and, though no doubt saddened, would perhaps approve of the present transformation of their old monastery. The Conservatory is in reality a large school with courses in agriculture and other branches of applied science and with well-equipped laboratories for instruction and research. The great French agriculturalist, J. B. Boussingault, who, on his estate at Bechelbronn, first took chemistry from the laboratory to the field and stable, was for many years connected with the Conservatory, and a monument with his bust very fittingly stands in front of the museum.

Royal Hungarian Agricultural Museum, Budapest

The best example of the general type of museum which depicts all branches of agriculture is the Royal Hungarian Agricultural Museum in Budapest. This museum, which outclasses all other institutions of its kind, dates back to 1896 when a desire was expressed to house the valuable agricultural exhibits of the National Millenium Exhibition at Budapest in permanent form. The Hungarian Parliament appropriated \$400,000 for a building and an additional \$80,000 for equipment. The museum, which was formally opened in 1907, is one of the architectural ornaments of Budapest, the three wings in Gothic, Renaissance, and Romanesque styles exemplifying types of construction peculiar to different periods of Hungarian history.

The Renaissance wing, which is the home of the agricultural exhibits proper, is divided into thirty-one sections. On the first, or ground, floor, are the sections devoted to meteorology; agrogeology; soils; water supplies; pastures; fodder crops; root crops; industrial and medicinal crops; leguminous crops; paprika (a distinctive Hungarian crop remarkable for its high Vitamin C content); cereal crops; flour; protection against fungi, weeds, insects and other pests; agricultural experiment stations; agricultural implements and machinery; and agricultural buildings, with models of houses, barns, and other farm structures. A room devoted to agricultural statistics and a large court with exhibits of Hungary's export trade are also on the first floor.

Ascending an imposing stairway the visitor comes to the sections on the second floor of the museum which comprise agricultural education; viticulture; wine making; horticulture, with models of fruit and wall pictures of fruit production; preserves and other fruit products; beekeeping; silk production; poultry and rabbits; swine; horses, with models of different breeds of horses and of a spirited Hungarian four-in-hand; veterinary science; cattle, with cases of models of different breeds; sheep; dairying, with an exhibit of dairy equipment and of pictures of dairy farms; and rural arts and crafts.

The Gothic wing of the museum building houses the large section on forestry in a vaulted room with panels of different woods and cases containing models of machinery used in timbering, tools used by foresters, and other exhibits. There is also a section devoted to fish culture and another to wild game with mounted stags, bears, boars, wolves, and other animals, hunting equipment, and similar paraphernalia. The Romanesque wing has an auditorium for meetings of agricultural associations and for public lectures upon agriculture and related subjects. The museum also contains laboratories and a library of 35,000 volumes for special agricultural investigations.

In the thirty-two years of its history, the Royal Hungarian Museum of Agriculture has demonstrated most conclusively its immense value both in the improvements which it has brought to the agriculture of the nation and in the awakened realization among the people of Hungary of the importance of agriculture to the national welfare. The museum has been used as a model by other countries that have established national museums of agriculture.

At the time of my visit to Budapest in 1930, Alajos de Paikert was director of

the Hungarian Museum of Agriculture. He had been agricultural attaché at the Austro-Hungarian Embassy in Washington from 1900 to 1903 and was thoroughly familiar with the agriculture of the United States. As he escorted me about his museum he remarked: "If little Hungary can afford to erect and equip an agricultural museum such as this, the great nation of the United States should have one of far greater magnitude."

Open-air Agricultural Museums of Sweden, Norway, and Denmark

Another unique type of museum has won special prominence in Sweden, Norway, and Denmark. It is the open-air agricultural museum, first inaugurated at Stockholm in 1891 by Dr. Arthur Hazelius, a Swedish teacher, antiquary, and patriot, whose basic idea was to preserve in permanent form collections of old farmsteads and rural workshops of different periods and localities, with all their appropriate furnishings and equipment, and then to recreate the life of these vanished times by populating his museum colony with peasants and workers in appropriate native costumes. The idea has become so popular that now even little towns in the Scandinavian countries have their open-air museums where the visitor can familiarize himself with the culture, farm life, and home arts and crafts of the community in previous times. Groups of farm buildings from distant places have thus been taken apart, moved, and re-erected with needful restoration in beautiful park-like localities where the people on holidays can enjoy themselves and relive the simple rural life of their ancestors.

In the community which Hazelius created at Skansen, there are numerous farmsteads, cottages, stores, an ancient country church where weddings and services are occasionally celebrated, a market place, windmills, bell towers, an old-time Maypole, workshops where men can be seen at their old-time occupations, and weaving sheds where women in peasant costumes are busy at their spinning wheels and looms. In the midst of this wonderful creation are the old home and the grave of Hazelius himself, so that one may very aptly apply to him the same inscription that is found on the tomb of Sir Christopher Wren in St. Paul's Cathedral in London, "If you seek his monument, look around."

The Alvros farmstead at Skansen, consisting of a dwelling house, barn, dairy, storehouse, and some ten other sheds and miscellaneous structures, gives a good general idea of the grouping of log buildings about a central court on an old Swedish estate. A beam in one of the cattle sheds has carved upon it the date 1752. Back of this farm is a camp of Laplanders with a pen of reindeers feeding on their usual ration of moss. The interiors of the numerous farmhouses at Skansen show old kitchens with fireplaces, cooking utensils, shelves of pewter and earthenware dishes; sleeping rooms with carved wooden beds; weaving rooms with looms and spinning wheels; and living rooms with timbered ceilings, wall decorations, antique clocks, chairs, tables, painted chests, and other furniture.

Anders Zorn, the Swedish artist, installed a very pretty little open-air museum at his home in Mora. It has the same arrangement of log buildings about

a courtyard with a large well sweep. The reproduction of a lane at Zorn's old farm shows the details of shed, gate, and fence construction. One of the buildings removed there by Zorn is said to be nine hundred years old. Each is furnished in the style of its period, and in one of them Zorn has made a collection of old kitchen utensils, tools, lanterns, cheese moulds, almanac sticks, baskets, and other curiosities.

One of the finest open-air agricultural museums is the immense Sandvig collection at Maihaugen, Lillehammer, Norway, in the midst of the fertile farming district about Lake Mjøsa. The buildings of several large farming communities have been reerected, comprising in all some eighty structures of different periods, including three ancient churches and some fifty old workshops. In some respects this museum excels the one at Skansen, a particular convenience being the English-speaking Norwegian girls in native costume who act as guides.

The residences, storehouses, lofts, sheds, etc. of the Bjørnstad farmstead at Lillehammer form a group of twenty-six buildings, one of which dates back to 1500. They are of heavy timber construction with sod-covered roofs and carved beams. The Øygarden group of nineteen farm buildings is of similar interest. The interiors of these buildings are most fascinating, particularly the kitchen fireplace and the furnishings of the sleeping rooms in a country parsonage of the year 1650. The wood carvings and other decorations show the artistic skill of the native craftsman. Another interior of a farm parsonage from Isum of about the year 1500 shows not only fine wood carving but the old method of decorating the plain timber walls and ceiling with arabesque designs drawn with chalk and charcoal. Other decorative work is shown by the harness fittings and sledges in one of the exhibition galleries of the Sandvig collection at Lillehammer.

At Bygdø, near Oslo, is another very extensive open-air agricultural museum, and smaller ones may be seen at Voss, Fagernes, and other towns, each vying with the others in the preservation of its local agricultural and cultural antiquities. Descriptions of these must be passed over in order to refer briefly to the agricultural museum at Lyngby near Copenhagen in Denmark.

This is a combination of the open-air and general type of agricultural museum. Some twenty old farm buildings with thatched roofs have been assembled and reerected at Lyngby. The visitor is treated to many delightful surprises as he goes from room to room in these quaint old farmsteads, in some of which the family and farm animals lived under a single roof in closest proximity. Among the farmsteads of this open-air museum is the grave and monument of Bernhard Olsen, the founder of the collection.

Directly across the street from the Lyngby open-air museum is the general agricultural indoor museum. The two museums being complementary, one should not be visited without seeing the other. The indoor museum contains over eight thousand entries. The evolution of all the farm machines used in Denmark is traced by means of originals, models, and illustrations. Models of farmsteads show the structure of buildings. All of the different phases of husbandry, experiment stations, agricultural education, and statistics are il-

lustrated by photographs, charts, and diagrams. The exhibit of rural arts and crafts is extensive and a series of fine paintings such as a harvesting scene, the clearing of land in winter, an old grandmother working at her loom, and a household engaged in the mangling and beating of flax, illustrate the social side of farm life in the old days. It is in this way that the interest of the people of Denmark is aroused in the agricultural history of their past.

CONCLUSION

This very incomplete sketch of the agricultural museum movement in European countries should be sufficient to instruct us as to our own shortcomings. We have not advanced but have gone backward since Townend Glover resigned from the United States Department of Agriculture some sixty years ago.

When a foreign scientist calls and asks to see our agricultural museum in order that he may obtain in the limited time at his disposal a rapid survey of the agriculture of the United States and of the work of our Department of Agriculture, the most that can be done under the circumstances is to refer him to certain bulletins, but these are a very inadequate substitute for a well-equipped general agricultural museum. This need, as previously mentioned, was indicated by Secretary Rusk in his report for 1890, in connection with other arguments which are even more pertinent today than a half century ago. Uncle Jerry's plea was for the restoration of a neglected museum. What would have been his words had he known that the time was soon at hand when there would be no museum at all?

We need a national agricultural museum, not only for the benefit of the increasing numbers of foreign visitors, but for instructing our own specialists who are often only too ignorant of the work being done in other fields than their own. Our proposed museum would also serve the purposes that are being performed by many of the foreign agricultural museums. Its functions could be admirably interwoven and integrated with the work of the Graduate School and other educational instrumentalities of the Department of Agriculture. In the foreign museums the visitor sees classes of students, conducted by their professors from one exhibit to another, taking notes from the explanations that are given. It takes many trips of extensive study to complete the circuit but when once completed the student has gained a better knowledge of what scientific agriculture is and means than he can acquire from books.

The stimulus to research which such a museum offers must not be overlooked. Specialists gain from a well-coordinated representation of the different fields of agriculture a clearer and more enlarged vision of the interrelations of their own activities with those of other scientists. An agricultural museum also serves as a hall of fame where exhibits of great discoveries in husbandry and portraits and busts of men who have promoted agriculture act as a powerful incentive to the making of new discoveries.

A national agricultural museum is also needed for the preservation and adequate exhibition of the valuable collections of soils, farm products, research specimens, and other material which have been acquired in connection with

the work of the different bureaus of the Department. Certainly they should not be kept packed away in cases in basements, hallways, and attics where they lie forgotten, and, from lack of frequent inspection, undergo constant deterioration.

Probably even more important is the utility of such a museum as a means of public instruction. This applies not only to the crowds who come in person, but to that greater audience in colleges, schools, and kindergartens who could be reached by small cabinets of appropriate exhibits constantly supplied from a national center. The benefit of this particular service is incalculable. It was proposed seventy years ago by Townend Glover in his program for a national museum of agriculture, and it is one of the leading functions of such museums in Europe. The same service is rendered in a somewhat different way by supplying stock exhibit material to fairs and expositions. Experience has shown that participation of this kind always redounds to the great benefit of the museum, for new donations are acquired from exhibitors when the expositions are over.

Among other services which a national museum of agriculture can render is the one mentioned for the colonial institutes of Great Britain and Holland which act as clearing houses of information for manufacturers engaged in the industrial utilization of farm products. There will shortly be a need for a national center where the results of the work of the regional laboratories of the United States Department of Agriculture can be displayed.

An agricultural museum serves also as a repository of historic objects that illustrate the progress of agriculture in the life and growth of the nation. Such objects include not only exhibits of antique farm equipment and the like, but representations, by models, dioramas, and paintings, of the past agricultural life of the people. A national museum of agriculture might almost be called a temple of agricultural history.

Finally, by the exhibition of fine specimens of the rural arts of the farm population, the cultural life of our people is greatly stimulated and enriched. Their happiness and artistic sense are promoted both by exhibitions of their own work and by displays of the work of their pioneer ancestors who helped to make this nation great. The beautiful collection of rural arts exhibited by Allen Eaton in 1937 for the seventy-fifth anniversary of the founding of the Department of Agriculture was an evidence of what can be accomplished in this direction. This exhibition aroused great interest and admiration and the hope was repeatedly expressed that it might be given a permanent home. It was an indication of what might be shown in the division of rural arts of a national museum of agriculture. May the splendid efforts in this field be greatly multiplied and help bring to permanent realization the plan for a national museum of agriculture—a plan that was so zealously fostered by the founders of the United States Department of Agriculture as a necessary part of its organization.

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PETER KALM'S DESCRIPTION OF HOW SUGAR IS MADE FROM VARIOUS TYPES OF TREES IN NORTH AMERICA

ESTHER LOUISE LARSEN, *translator*

The writings of Peter Kalm,¹ the famous Swedish botanist, are among the most important sources of historical information on mid-eighteenth century America. Historical students are generally familiar with Kalm's famous journal, *En Resa til Norra America* (Stockholm, 1753-1761), which has been translated and variously published in Dutch, English, French, and German, but his articles on American subjects which were published in the Kongl. Svenska Vetenskaps Academiens *Handlingar* for 1749 to 1778 are also important, especially for the scientific observations which they contain, and deserve translation and scholarly attention. The article in this series which appeared with the title, "Beskrifning Huru Socker göres uti Norra America af åtskilliga slags trån," in the *Handlingar*, 12:143-159 (1751) is here translated for the first time. Kalm's article on maize—"Beskrifning om Mays, Huru den planteras och skötes i Norra America, samt om denna Sâdes-artens mångfaldiga nytta," in the *Handlingar*, 12:305-318 (1751); 13:24-43 (1752)—has been translated under the title, "Pehr Kalm's Description of Maize, How It Is Planted and Cultivated in North America, Together with the Many Uses of This Crop Plant," in *Agricultural History*, 9:98-117 (April 1935).

[Text]

It is generally known that sugar and syrup have been made from sugar cane for a long time. Since the improvement of navigation in recent times, man has cultivated the plant more extensively in order to have the advantage and use thereof.

Experience has shown that sugar cane can only thrive in the warmer climates, namely those lying below the equinoctial line or those lying close to it. Sugar cane does not develop to advantage in regions further north. If sugar is not desired, cane may be grown in an orangery for pleasure.

Our forefathers, who were not familiar with real sugar, made use of honey and mead which is mentioned in several places in our ancient histories. The same practice was followed by many European and Asiatic peoples in ancient times.

Other nations have used something else in place of sugar. Mr. Strahlenberg in *Nord-und Östliche theil von Europa und Asia* on page 430 and page 434 tells of a fruit called *Ahahatka*, which is used in place of sugar by the inhabitants of Kamchatka.² In a similar

¹ For biographical information on Peter Kalm, see *Agricultural History*, 9:98-101 (April 1935); and A. B. Benson, ed., *The America of 1750; Peter Kalm's Travels in North America*, 1:vii-xviii (New York, 1937). The latter work contains "A Bibliography of Peter Kalm's Writings on America," 2:770-776, which originally appeared in *Scandinavian Studies and Notes*, May 1933, p. 89-98.

² Philipp-Johann Tobbert von Strahlenberg, *Das Nord-und Östliche theil von Europa und Asia, in so weit solches das gantze russische reich mit Siberien und der grossen Tatarey in sich begreiffet*. . . (Stockholm, 1730).

manner other people have used plants or the like for the manufacture of sugar-like material or juice.

The savage inhabitants living in North America have not been able to supply themselves with sugar from sugar cane which, because of the severe climate, is as unable to grow there as here in Sweden. If what has been written is true, sugar was not known in America before Columbus discovered the New World, and the Europeans introduced it from the West Indies.

The savages in North America could not make use of honey and mead as our forefathers had done, for they did not have the slightest knowledge of bees before they were introduced by Europeans. Consequently, the language of the savage has no name for the bee other than "Englishman's flies." The bees have now spread to such an extent in that country that bee logs are often found in various parts of the forests.

In the meantime, the savages have not been without their sugar, syrup, and mead. From prehistoric times, long before the Europeans arrived, the savages made sugar and sweet things from trees and plants growing around them. I will give a short list of those with which I became acquainted during my visit to North America. The list is as follows:

TREES

1. Sugar maple³ (see number 4 in my *Berättelse om nyttan och skötseln af de nyttigare växter, af hvilka frön nyligen blifvit hembragts från norra America*, printed by H. Salvius).⁴ It is from this tree that most of the sugar in North America is made. The French in Canada call it *erable*; the English, sugar maple, sugar tree, sugar wood, black maple, hard maple; the Dutch and Germans, *Noordtsche Notenboom*; the Swedes in Pennsylvania, *Rinnträ*; the Iroquois savages, *Ozekéhta*. At present I know of no botanist who has given the tree a Latin name. [John] Ray in his *Hist[oria] Plant[arum]*, 2:1701, puts it under *Acer montanum candidum* C[aspari] B[auhini], but that is a different species.⁵

2. Maple with red flowers.⁶ "*Acer folio-palmato angulato, flore fere apetalò sessili, fructu pedunculato corymboso*," Gron[ovius], *Flor[a] Virg[inica]*, 41. Linn[aeus], *Hort[us] Ups[aliensis]*, 94. (See number 5 in the *Berättelse* cited above).⁷ A good deal of sugar is made from this tree, but the sap is more watery than the former; longer cooking is necessary in order to obtain a smaller amount of sugar than that produced from a like amount of sap of the former. The sugar produced is darker, sweeter, and more healthful to use and is especially good for the chest. It is called *plaine* or *plane* by the French. The English simply call it maple, and the Dutch, *Bellstael*.

³ *Acer saccharum* Marsh.

⁴ The reference is to Kalm's pamphlet, *En Kört Berättelse, om Naturliga stället, nyttan, samt skötseln af några växter, utaf hvilka frön nyligen blifvit hembragte från Norra America, til deras tjenst, som hafwa nöje, at i vårt Climat göra försök med de sammas cultiverande* (Stockholm, 1751), which is translated under the title, "Peter Kalm's Short Account of the Natural Position, Use, and Care of Some Plants, of which the Seeds were recently brought Home from North America for the Service of those who take Pleasure in Experimenting with the Cultivation of the Same in our Climate," in *Agricultural History*, 13:33-64 (January 1939). The description of "Number 4" is on pages 35-36 of the translation.

⁵ *Acer Pseudo-Platanus* L.

⁶ *Acer rubrum* L.

⁷ See p. 36 of the translation cited in footnote 4.

3. Sugar birch⁸ (is *Betula foliis ovatis oblongis acuminatis serratis*, Gron[ovius], *Flor[a] Virg[inica]*, 188). Sugar is also made from the sap of this tree. It is not as sweet as that of the second, discussed previously, but tastes a little bitter. The French call the tree *merisier*; the English, sugar birch, wild birch, and black birch.

Observation: In North America our most common birch is found in large quantities.⁹ From it the French as well as the savages make their birch-bark canoes. I have seen these canoes so large that they could carry thirty men, and yet so light that they could be carried great distances over land and high mountains on the shoulders of six men, who travelled at such a rate I had difficulty in following, although I had nothing to carry. From this tree the French as well as the savages have attempted to cook sugar, but it is not worth while.

4. Hickory,¹⁰ "*Nux juglans Virginiana alba minor, fructu Nucis moschatae simili, cortice glabro, summo fastigio veluti in aculeum producto*," Pluk[enet], *Phyt[ographiae]*, Pt. 4, London, 1696] which is the walnut tree (see number 64 in the *Berättelse* cited above).¹¹ A sugar is made from this tree which is sweeter than that from other types, but the tree produces such small quantities of sap that it is not worth the trouble. It is called *noyer amer* by the French, hickory by the English, *Nötbom* by the Swedes, and *Notenbom* or *Kisketas* by the Dutch.

5. Gleditsia,¹² Gron[ovius], *Flora Virg[inica]*, 193; Linn[aeus], *Hort[us] Ups[aliensis]*, 298, or the honey-pea (see number 48 of the *Berättelse* cited above).¹³ A mead is cooked from the legumes. [John] Lawson, in the *Natural History of Carolina*, 97 [1718 edition], says that whole orchards have been planted for that purpose. The English call this tree the honey locust.

HERBS

6. Mays,¹⁴ or Turkish wheat, *Zea*, Lin[naeus], *Hort[us] Cliff[ortianus]*, 437. When the maize stalks are green and the ears are not yet ripe, there is, inside of the stalks at the nodes, a clear juice which is quite sweet, from which sugar is occasionally made. A great deal of maize is destroyed by this process as each stalk contains only a small amount of this juice. Savages and others cut off the green maize stalks and suck out the sweet juice.

7. *Asclepias*,¹⁵ "*caule erecto simplici annuo &c.*," Linn[aeus], *Hort[us] Cliff[ortianus]*, 78 (see number 15 in the *Berättelse* cited above).¹⁶ From the flowers of this plant, sugar is cooked in the following manner: The flowers are taken early in the morning while they are full of dew. They are crushed, and sugar which is brown and rather good is cooked from the juice, but the quantity is so small that it is not worth the trouble.

Father Charlevoix, in the *Histoire [et description generale] de la Nouvelle France*, 5:181

⁸ *Betula nigra* L.

⁹ *Betula alba* L., the Swedish birch closely resembles *Betula papyrifera* Marsh. which is the canoe birch of North America.

¹⁰ *Carya*.

¹¹ See p. 47 of the translation cited in footnote 4.

¹² *Gleditsia tricanthos* L.

¹³ See p. 44 of the translation cited in footnote 4.

¹⁴ *Zea mays* L.

¹⁵ *Asclepias syriaca* L.

¹⁶ See p. 38 of the translation cited in footnote 4.

[Paris, 1744] writes that sugar is also made from ash, that it is very sweet, but the quantity is small. I myself heard nothing about this in North America so I do not know how true this is. Is it not possible that Father Charlevoix has mistaken the ash-leaved maple or *Acer Fraxini foliis* (see Gron[ovius], *Flora Virg[inica]*, 154), which grows abundantly in North America and is incorrectly referred to by the layman as ash or white ash?¹⁷ If the ash-leaved maple is tapped in the spring a great quantity of sap exudes.

I do not remember hearing of any other trees or herbs used by either savages or Europeans for obtaining sweet sap or making sugar. Because of the fact that it is from the so-called sugar maple that most sugar is made, I will give a description of the process. Most of the sugar or syrup made from other plants is made by the same method. A good deal of this has probably been discussed by other authors, but these accounts are either very brief, incomplete, or, from what I have heard and read, inaccurate. In the meantime, in order that those who wish to see what others have written may know where to look, I will list the authors I recall who discuss this subject in their works. Most of them have only discussed the first type, the sugar maple, and barely mention the others, if at all. The authors are as follows:

[John] Ray, in the *Historia Plantarum*, 2:1701, only says that the Canadians make sugar from sap, but does not describe the method. Several botanical treatises have been published by him since that time which, when they discuss this sugar maple or our European maples, usually do so with fewer words than Ray. I omit them all. In Mr. Ray's *Philosophical Letters* [. . . , London, 1718], published after his death, there is a discussion of the subject on pages 177, 179, and 180, but it is no more extensive than that in the *Historia*.

Lawson, in the *Natural History of Carolina*, 105, mentions the fact that savages make sugar from the sap of the sugar maple, but discusses it no further.

[Paul] Dudley, in the *Philosophical Transactions*, [31] (1):27, for the year 1720, and in the [John] Lowthorp's, *Philosophical Transactions, Abridged*, 6(2):379 [London, 1754], describes briefly the process of making this sugar but omits a large number of necessary details. If we follow the method described by him, the trees tapped will be ruined and die in a few years. In a much earlier number of the same *Philosophical Transactions*, the vague statement is made that the savages in North America make sugar from a type of maple, but the type is not mentioned.

[Robert] Beverley, in *The History of Virginia* (1722 edition, 8:vo), 118-119, has some information not found elsewhere, but his discussion is not extensive.

Father Charlevoix, in *Histoire de la Nouvelle France*, 5:179-181 (1744 edition, 12:mo), discusses the subject extensively. He includes much omitted by others, but omits various necessary details, not to mention the fact that he has been falsely informed that this sugar is more tasty than that made from sugar cane. These are the most important authors who have treated the subject. Now I will discuss the making of sugar.

The sugar maple is the chief tree from which sugar has been made in America since ancient times.

It is to be noted that in Canada and the northernmost part of the English colonies, where winters are long and severe, the forests are largely composed of sugar maple, which is one of the most common trees of the region. Further south it is one of the rarest trees and is only found—and then only rarely—either on high mountains or on the north side of high hills or river banks. It is a tree which requires a cold climate.

¹⁷ *Acer negundo* L.

The savages from prehistoric times, long before the Europeans discovered America, made maple sugar. The Europeans have now learned the method and nearly all of them who live where this tree grows make a large quantity of sugar each year. In Canada, both the savages and the French make this sugar, but that made by the French is usually the best, for the savages adulterate theirs with flour, either to make it more palatable or to increase the quantity for sale. The adulterated sugar can be melted and separated from the flour, and it can be completely purified.

The sugar is manufactured in the following manner:

In the spring when the snow begins to melt, the trees fill with sap like our Swedish birch. If a tree is cut or chopped a large quantity of the sap exudes. The sap runs for about three weeks, but this period varies somewhat according to weather conditions. As soon as the snow begins to melt, a hole is cut or bored into the tree in the same manner used for tapping birch trees here in Sweden. A small spout is put into the hole, and a pail is put under the spout. The sap then flows into the pail abundantly.

When a tub of the sap has been collected, or as much as is considered necessary, the sugar is cooked in the following fashion. A large iron or copper kettle is filled with sap. It is cooked until it gets so thick that it can no longer be easily stirred with a ladle. It is then lifted from the fire and stirred rapidly until it is entirely cool and the sugar syrup has hardened into sugar. If sugar in a special form is desired the thick syrup can be poured into a mold, cup, or vessel, and it is shaped accordingly.

Nothing is added to the wort (if I may be allowed to refer to it by that term) to thicken it. It is entirely pure and the sugar is made from only the sap of the sugar maple.

Others who wish to be more particular in cooking sugar use the following method. The cooking of sugar begins when enough sap has been collected. There are usually many kettles, one of which is larger and contains the wort which is being cooked. Fresh sap is put into the other kettles and allowed to cook until it has boiled down to half of the original quantity or less. It is then poured, as hot as it is, into the large kettle containing the more concentrated wort. The large kettle remains on the fire, cooking all the time until the wort becomes quite thick and then special care must be taken not to add cold sap. The sap and wort are cooked together until they become quite thick. There are two ways to judge if the sap and wort are sufficiently cooked to form sugar. First, while the wort cooks there is usually a heavy scum on it, as long as the scum shows the wort is not sufficiently cooked; the more nearly it is cooked the smaller the amount of scum on the wort. The second method of testing is to take a spoon of the wort and allow it to cool in order to see if it thickens and turns to sugar. If it does not harden, it has not been cooked long enough. It is said that those accustomed to the process can easily judge when cooking and thickness are sufficient, but it is not as simple to learn from description and directions as from experience.

When the proper thickness has been reached, the kettle is taken from the fire, set on the coals, and stirred rapidly to prevent the wort from burning, and the sugar from sticking to the kettle. The stirring is continued until the wort gets so thick that it begins to be like flour. The kettle is then put in a cold place. The sugar obtained by this method is like the brown flour-like sugar or muscovado.

If cakes or solid pieces are desired, the stirring in the kettle is not continued until the sugar becomes flour-like. Instead, while the substance is quite liquid, it is poured into shells or other vessels, depending on the shape desired, and allowed to cool.

In the making of sugar the following details are significant:

The greater the amount of snow during the winter, the more severe the cold, the greater the quantity of sap produced by the sugar maple during the following spring.

The first sap which runs from the sugar maple in the spring is sweeter than that which runs later. The more intense the cold, the greater the quantity of sugar in the sap. The warmer the air, the smaller the quantity of sugar in the sap which runs from the trees.

The slower spring comes and the longer the snow lasts before it melts, the more sap and, consequently, the more sugar produced. If the spring comes quickly and the snow melts quickly there is not nearly the quantity of sap as it soon quits running, because of the heat. If the weather becomes unusually warm the sap quits running immediately.

If an east wind blows, the trees appear to give very little sap, for the wind is either warm or moist.

The heavier the frosts are at night in the spring when the sap is running, the greater is the quantity of sap produced the following day.

During clear weather more sap is produced than during cloudy weather.

The most sap is obtained if there are heavy frosts during the nights and the following days are clear and not too cold. During the night the trees give practically no sap, provided the night is not too mild.

Medium-size trees give the most and best sap. Those which are very old and large are seldom tapped.

Trees which have been tapped for many years give less sap in proportion, but the sap is sweeter.

Trees of the same age do not always give the same quantity of sap or sugar. Often one tree produces the same amount of sap as another, but not necessarily the same quantity of sugar.

The sugar maple growing on stony mountains or high land gives much sweeter sap than the sugar maple growing on low, moist soil. The sap of the latter is not as sweet as that of the former, nor does it produce as much sugar.

It is generally estimated that a good tree will give four to seven or eight cans of sap a day, for when it is running best there is practically a steady stream.

If the tree is well chosen and weather conditions are as previously described, a good tree will produce thirty to sixty cans of sap and occasionally more.

Sixteen cans of sap will produce a good *skålpund* of sugar and if the sap is unusually sweet even less sap is required.¹⁸ I was amazed to learn that a *skålpund* of sugar had been obtained from five cans of sap. The sap in such instances was obtained from trees growing on high, stony, mountainous land.

Two people can easily cook two hundred *skålpund* of sugar during the spring and still attend to various other duties.

If the trees are treated properly, they do not die and are not injured even though they are tapped yearly. They can last many years and each year give a large quantity of sap. In tapping the tree care should be taken to place the bore upward into the tree, not downward. If the bore is down into the tree, rain water will collect and rot the tree. In addition care should be taken to tap the tree on the same side each year, otherwise, if it is tapped all the way around, the tree will die in a few years.

Sugar made from this tree is said to be much more healthful than ordinary sugar and is unusually good for the chest and its diseases.

¹⁸ The *Skålpund* or Swedish pound equals .937 pound avoirdupois.

The sugar is brownish in color, for it has not been refined. It is occasionally as fine as flour, resembling muscovado sugar, but usually it sticks together forming larger or smaller lumps, although it is manufactured into various sizes and shapes depending on the form and size of the vessel in which it is molded when poured from the kettle. The sugar is ordinarily sent to Europe in small handbreadth jars.

Maple sugar does not melt readily when placed in water or other liquid. When I used it with tea I found that ordinary sugar made from cane melted three to four times as fast.

It is not as nourishing as ordinary sugar. It is maintained that a *skålpund* of ordinary sugar is as effective for sweetening as two *skålpund* of maple sugar.

Maple sugar is said to be better than ordinary sugar for chocolate and just as good as ordinary white sugar for preserving citrons, cranberries, and various other things. Because the whortleberries are rather rare in North America, the cranberry is used in its place, and it is prepared in the same manner as we prepare our whortleberries.

In contrast, maple sugar is not as good as ordinary sugar for preserving gooseberries, neither is it as good as white sugar for tea and coffee. However, it is passable in these drinks if milk is added.

It is possible that this sugar could be greatly improved by refining and then it would probably vie with ordinary sugar. Up to the present time it has been made mostly by savages and farmers for their own use. You can well imagine how far their thoughts go in the direction of improving that which they have learned from their grandparents.

Each year quantities of this sugar are shipped to France, primarily because of its properties in aiding in treatment of diseases of the chest.

When we reached the villages of the savages we received more than anything else gifts of large pieces of sugar which stood us well in hand on our trips into the wilderness. When the savages cooked gruel or mush for us from corn meal they added large lumps of sugar to make up for the lack of milk—for the savages have no livestock, if you except dogs and fleas. I noticed that the Europeans nearly always excelled the savages in the art of sugar making. In that made by the savages there nearly always remains a large quantity of syrup which makes it difficult to carry.

The common people in the northernmost English colonies, as well as the French in Canada, supply themselves with a large quantity of this sugar each year. Farmers often have as much as a quarter of a barrel for a household. Practically every soldier in the French forts manufactures a year's supply of this necessity for himself in the spring. If you visit the French you will see no other sugar used. When milk is served it is heavily flavored with sugar, and the sugar bowl is placed on the table so everyone can sweeten his food according to his taste.

Often in the spring and summer when nothing better is available, the common people eat sugar with the bread or spread it on the bread thick and eat it like *Smörgåsar*. If too much of it is eaten it destroys the teeth and the health may be injured. This is generally true when sweets are eaten in large quantities. I have in my travels through the lands of the savages had many good meals of just sugar and bread when no other food was available.

The morass is so deep in many parts of the wilderness that horses cannot be used. Water cannot be carried as all supplies must be packed on the back. I always put some sugar in my mouth when drinking the available water. The taste of the water which was usually bad was improved, and it agreed with me fairly well. In contrast, my compan-

ions, and even the savages, who, in the English fashion, mixed a quantity of rum or corn liquor with the water which they drank, got deathly ill on the journey.

Quitsera, or the nourishing food which is used by the savages and even the French on their long journeys through the wilderness when they cannot carry much food, is made of maize flour, and this sugar prepared and mixed by a special process. I heard the French in Canada say that if our great King Carl XII had used this food he could have conquered the entire world. A small sack of this food, which can be carried under a man's arm, can serve as his food for one or two months. Another time when I discuss the properties, uses, and cultivation of maize I will discuss this more fully.

In many localities this sugar is considered twice as valuable as ordinary sugar. Although a proportionately greater quantity must be used, it is more healthful and more nourishing.

Aside from the sugar discussed here, a syrup is also made which is quite good.

If syrup is to be made, the sap is not allowed to cook until it is too thick. The thickness of the syrup depends on the taste of the individual. Whenever sugar is made, some syrup usually remains. The last sap collected is usually quite thin and is used in the making of syrup.

The syrup is sweet, cooling, and very refreshing, good for the chest, and has the best flavor one could desire. I have seen it so thick and sweet that it had to be diluted with water before it was used as a drink. The officers of the French forts in Canada supply themselves each spring with a large quantity of the syrup which they give to their friends when they come visiting. If the syrup is mixed with water, it makes a good healthful drink. It is also used for various confections and in preserving fruits.

Even the sap of the tree is good to drink, as it is delicious, refreshing, sweet, and quite healthful.

This is what I was able to learn in America about the making of sugar and syrup from the sugar maple. Each farmer uses the products of twenty to forty trees yearly for his household. These useful trees pay well for the small area of ground they cover, and, in addition, are ornamental to the estate. This tree prefers a cold climate; therefore, it should be able to grow without difficulty here in Sweden.

In conclusion, I wish to state that there is such a close relationship between the sugar maple and our Swedish maple, both in the shape of leaves and habit of growth, that they are apt to be confused unless carefully studied. I have been informed that if our Swedish maple is tapped in the spring a sugary sap is exuded; it is said to have been made into sugar. It would be well for others to repeat this experiment. Ray and other botanists say that all maples produce a certain quantity of this sap in the spring. Experiments will show which type gives the most sap and the greatest quantity of sugar.

June 22 [1751].

MEMOIRS 6 OF THE PHILADELPHIA SOCIETY FOR PROMOTING AGRICULTURE¹

CARL R. WOODWARD

In the history of rural America, the Philadelphia Society for Promoting Agriculture occupies a place of rare distinction. Founded in 1785, it is commonly accepted as the oldest of the American agricultural societies. It numbered among its original members several of the founders of the Nation. It has pioneered in movements devoted to agricultural progress. With but few brief interludes, it has had a continued existence of more than a century and a half, and is today an energetic, forward-looking body. Lately, the society made a choice addition to the growing literature of agricultural history by publishing the sixth volume of its *Memoirs*.

This volume stands in contrast with its predecessors, because it gives a view of the society in retrospect, instead of relating current achievements and conveying information on improved farm practices, as the earlier *Memoirs* were designed to do. More than a century has passed since a *Memoir* has appeared. The first was published in 1808; volumes 2 and 3 appeared in 1814, and the next one, four years later. The fifth, and last until the recent one, was published in 1829. Some of these early *Memoirs* are now quite rare, hence much sought after by agricultural libraries.

The new volume contains a miscellaneous collection of material that reflects graphically the story of the society since its founding. First of all is a reprint of the 20-page historical sketch prepared for the society's sesqui-centennial in 1935 by Dr. Rodney H. True of the University of Pennsylvania. The first printing of the sketch was quickly exhausted, and it is gratifying to have this excellent record permanently preserved and made more widely available.

The bulk of the 228-page volume is devoted to extracts from the society's minutes, to correspondence between officers of the society and numerous distinguished persons, to accounts of various agricultural practices, and to addresses before the society and other organizations—altogether more than fifty different items. Appended is a complete list of all known members of the society since its founding, and also persons selected by the society for special recognition, together with the citations of their outstanding contributions to agriculture.

The membership list contains many prominent names—General George Washington, also Bushrod and John Augustus Washington; Dr. Benjamin Franklin, his grandson Temple Franklin, and his son-in-law Richard Bache; General Nathanael Greene, and Dr. George Logan. Among the founders were four signers of the Declaration of Independence: George Clymer, Robert Morris, Dr. Benjamin Rush, and James Wilson. The moving spirit of the founders was Judge John Beale Bordley, one of the earliest American writers on agriculture. Samuel Powel was the first president and Judge Richard Peters, distinguished Philadelphian, was president from 1805 to 1828. Arthur Young and Sir John Sinclair, fathers of the British Board of Agriculture, were elected to honorary

¹Orders may be addressed to L. Wayne Army, Secretary, Philadelphia Society for Promoting Agriculture, Land Title Building, Philadelphia, Pennsylvania. The price is \$2.50 per copy.

membership. Through this connection a set of Young's *Annals of Agriculture* was acquired. This noteworthy series formed the nucleus of the excellent collection of early works on English agriculture which the society still maintains in its library at the University of Pennsylvania School of Veterinary Medicine.

These pioneers and others come to life in the pages of the new volume. There is a letter written in 1773 by Francis Alison to the American Philosophical Society, proposing that attention be given to ways and means of improving agriculture—the idea in embryo of the agricultural society. There is a letter to Arthur Young from George Washington, revealing his agricultural philosophy. Then there are letters from James Madison, John Adams, Thomas Jefferson, and Josiah Quincy.

The subject matter treated is as varied as the wide range of agriculture itself. In 1785, George Morgan of Princeton wrote a letter about beans, barley, and clover; the next year he submitted a plan for a farmyard, which won him a medal, the first premium to be given by the society. Judge Bordley drafted in 1786 plans for a drill and for threshing floors. Again, in the early years of the society Humphrey Marshall discussed the applications of botany in rural economics; and Henry Wynkoop wrote on plaster of paris as a fertilizer for grass. Dr. George Logan advocated the use of malt and beer for harvest hands “to banish the Rum bottle from our plantations.” Observations on the Hessian fly—a new and serious threat to the wheat crop—were contributed by Col. George Morgan, Henry Wynkoop, Elias Boudinot of New Jersey, General Peter Muhlenberg, Robert R. Livingston, and Dr. Charles H. Wharton. Boudinot also described his experiments on the time and method of harvesting Indian corn. Col. Timothy Pickering wrote on peas, George Vaux on corn, Eleazer McComb on a cart for spreading manure, and Dr. Benjamin Rush on the need for the study of diseases of domestic animals. These and numerous other items reprinted in the *Memoir* appear to be a fair sampling of the agricultural practices of more than a century ago, the problems the farmers had to meet, and the trend of their thinking.

The several well-selected illustrations add greatly to the reader-interest of the volume. The society's gallery of presidents is reproduced, including two portraits—those of James Mease and Nicholas Biddle, believed to have been executed by Sully. Facsimiles of the minutes of the meeting at which George Washington was elected, of a letter from Arthur Young, of a letter from Washington to Judge Peters, and of a letter from Judge Peters to General Lafayette, who became a member of the society in 1825, effectively supplement the text. Five of the society's illustrations of famous cattle are reproduced, among them lithographs of two mammoth oxen of a century ago, the Earl of Jersey and the Duke of Gloucester, each of which weighed more than 3,000 pounds.

Excellent as it is, the volume is not without fault. It is greatly to be regretted that no index was provided. The material, also, might have been better arranged. Neither a chronological nor a subject-matter classification is consistently followed. Larger captions, too, would have made the text more readable. It does, however, represent a first-class job of printing and binding, and would be at home on the most aristocratic of library shelves. The committee of the society responsible for the volume—Mr. Lawrence J. Morris, Mr. John M. Okie, and Mr. Richard Peters, Jr.—deserves high praise for its achievement.

In addition to the documents reprinted here, the society in recent years has unearthed numerous additional letters, essays, and other papers relating to the early activities of the society. May we venture the hope that the favorable reception this volume deserves will prompt the society, in the early future, to publish other *Memoirs* which will make these papers available to the addicts of agricultural history.

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EROSION: A HERITAGE FROM THE PAST

LOIS OLSON

However valuable the mineral and other resources of a country may be, its fundamental wealth lies in the soil. Twenty-three hundred years ago, Socrates summed up this relationship by saying:

Agriculture seems to possess an incontestable right to the title of parent and nurse to all other professions. Observe a country where agriculture flourishes, and you will behold arts and sciences flourish in equal perfection! But where devastation lays waste the soil, or slothful neglect induces men to leave the earth uncultivated, a general stagnation in maritime as well as commercial affairs immediately follows.¹

Each subsequent generation has added to the agricultural wealth of the world, either through the discovery of new lands or by increasing the production of old lands. Today, most of the world's farming lands have been settled, and, in spite of agricultural progress, some of the regions that have been cultivated for only a few generations are showing signs of rapid deterioration that threatens the permanence of agriculture itself. Chief among these is soil erosion.

Some of the causes of accelerated erosion are local and can be removed by the application of improved methods of farming; others are beyond the control of individual farmers. What these are and how they operate is a problem the solution of which requires research in those countries where erosion or conservation have been active for long periods of time. Whether the fundamental causes of erosion are agricultural, economic, or political, experience derived from the past is of value in the interpretation of current problems.

Agriculture, the "parent industry," began to develop before the dawn of recorded history, and some of the earliest domesticated plants, such as wheat, are still among the world's major crops. Many of the primitive religions were agricultural in origin, and written language began with a discussion of agricultural problems. The oldest known writings of the world, antedating 3000 B.C. and coming from the lower delta of the Tigris and Euphrates rivers, concern a plague of locusts that devoured the crops. The same area was also the home of one of the earliest political powers in world history.

Like other Old World civilizations, it developed in a semiarid region where water was available for irrigation. Both the Tigris and the Euphrates rise in the mountains to the north, where rainfall is heavier and where melting snow increases the spring flow of the rivers. To the early cultivators of the lower delta, floods and sedimentation were the chief agricultural hazards; but the soil was remarkably fertile, and, to protect their fields, the Chaldeans confined the rivers within definite channels by means of immense dikes, frequently one hundred or more feet in width. From Chaldea and Sumer, agriculture spread northward.

For a distance of some two hundred miles south of Bagdad, the Euphrates

¹ Xenophon, *Oeconomicus*, 5:17.

flowed on a higher level than the Tigris, thus providing an ideal setting for the construction of irrigation canals that led from the upper to the lower level. To supplement this, three large reservoirs—one north of Bagdad and two west of the Euphrates—received excess flood waters and provided a basis for perennial irrigation. During floods, water from the Euphrates was directed to the west of the city of Babylon by means of the Hindiya canal. At the conclusion of the flood season, the water was redirected into its normal channel by constructing a dam at the head of the canal. This dam was built and destroyed annually, a task requiring the labor of ten thousand slaves.

Under the dominance of Babylon, the extensive irrigation works were subject to strict regulation. As early as the third millennium B.C., the Code of Hammurabi provided specific punishments for those who increased the hazards of flooding and sedimentation by neglecting their dams and irrigation ditches, and if fields were allowed to lie idle too long, the owner forfeited his rights to the land.²

As the area under cultivation increased, the problems of irrigation agriculture became more pronounced. The growth of Babylon was accompanied by a greater demand for wood for the construction of temples and palaces. Archaeological evidence indicates that in prehistoric times, the forests of the mountains to the north had been cut and the wood shipped down the river to Babylon. Along the lower Euphrates the height and thickness of the dikes that held the river within definite channels increased with the passing of time—an indication that floods in this region may have become more serious. Farther north, the sediment deposited by the irrigation waters gradually increased the height of the fields lying between the rivers until the rivers were forced to alter their courses. The Euphrates shifted to the west and the lower Tigris to the east. The Hindiya outlet of the Euphrates became the main channel, and the Tigris shifted its course to the east of the earlier Hai channel. In both cases, the distance between the rivers was increased and with it the difficulty of irrigation.

The labor necessary to maintain the irrigation works was provided by hosts of foreign slaves, among whom were the Children of Israel, who said: "By the rivers of Babylon, there we sat down, yea, we wept." The freeing of the Israelites by Cyrus of Persia provides an illustration of the instability of the labor supply, and its relation to political history. In other cases, military conquest had more direct effect upon the land. When Sennacherib, the King of Assyria, conquered Babylon he boasted:

In the midst of the city I cut channels, and the earth thereof I overwhelmed with water, and the structure of its foundation I destroyed, and I spread abroad its brickwork more than after an inundation. That in future days the site of that city and the temples of the gods no man may find, I destroyed it with water and blotted it out so that it became like unto a swamp.³

² R. F. Harper, *The Code of Hammurabi, King of Babylon about 2250 B.C.*, 31 (Chicago and London, 1904).

³ *Records of the Reign of Tukulti-Ninib I, King of Assyria, about B.C. 1275*, edited and translated from a memorial tablet in the British Museum, p. 121 (London, 1904).

The decline of Babylonian political power was accompanied by agricultural retrogression. To the northeast of Bagdad, the Oriental Institute of the University of Chicago has discovered the ruins of cities and extensive irrigation works in a region now covered with blowing sand. The destruction of the irrigation works was accompanied by land abandonment. Without the protective covering of crops, the soil that had been loosened by cultivation was left exposed to the wind. Archaeologists, excavating the ruined city of Tell Asmar, have experienced storms that carried dust to heights of 15,000 feet,⁴ and frequently, as a result of a single dust storm, inches of sand are blown into the excavations.

Throughout the centuries following the decline of Babylonia and Assyria, a few remnants of the former widespread irrigation system continued in use. Among these was the famous Nahrwan dam, that had been in use for over three thousand years and whose construction has been attributed to the legendary King Nimrod. Its destruction by the Turks, some six or seven hundred years ago, has been regarded as the final blow to the old agricultural traditions of Mesopotamia. As a result of the destruction of the dam, the course of the middle Tigris shifted eastward; and, according to Sir William Willcocks, some of the most fertile land north of Bagdad, near the head of the Nahrwan canal, has been ruined by gullies.⁵ Within the last generation several efforts have been made to restore agriculture to its earlier, high level, but so great is the task that no scheme has proved financially practicable.

The influence of Babylonian agriculture was not limited to the country itself. In the higher lands along the upper reaches of the Tigris and Euphrates rivers, large-scale irrigation was more difficult than on the delta. The agricultural development of Assyria came later, and both crops and farm practices were borrowed from Babylonia. Rivalry for use of the water for irrigation was a continuing cause of conflict between the two countries. Agriculture flourished in the lower delta only during periods of Babylonian ascendancy and later when Persia controlled the Tigris and the Euphrates in their entirety.

Trade rather than agriculture furnished the basis for Assyrian power. Assyria occupied a position on the "fertile crescent" midway between Egypt and Babylonia. To the south lay the Arabian desert and to the north, the mountains; both provided difficult routes of transport for armies and caravans. The scant rainfall of Assyria (less than 20 inches annually), supplemented by streams from the mountains, was sufficient for the production of food for men and beasts. Consequently, the piedmont of Assyria was coveted by all nations of the ancient world and was conquered and reconquered by Babylonia, Egypt, Persia, Greece, and Rome. In spite of repeated warfare, agriculture persisted, not because of favorable conditions but because it was necessary for the maintenance of trade. Later, when commerce with the East shifted to sea routes, agriculture entered a period of permanent decline. Some of the land reverted to its original semi-desert condition and, although there has been no permanent climatic change

⁴ Letter of John A. Wilson to W. C. Lowdermilk, Mar. 17, 1937.

⁵ Sir William Willcocks, *Irrigation of Mesopotamia*, 44 (ed. 2, New York, 1917).

within historic times, large areas that were once cultivated have become irretrievable waste.

Assyria provided the route of contact between Babylonia and Syria and Palestine. Records show that the latter two countries were inhabited by agricultural people during early historical times. When Abraham and his followers migrated from Ur of the Chaldees in lower Mesopotamia to Canaan, they were a pastoral people, but they gradually adopted the agricultural habits of the country. The rules for farming were incorporated into their religious code, and the "vine and the fig tree" eventually became the symbol of security among the Jews.

The Canaanites and Jews, like the neighboring Syrians and Phoenicians, raised crops that originated farther east, and in early times only the lowlands were cultivated. Sheep and goats were pastured on the hills, but the scarcity of level land resulted in the pasturing of horses being forbidden by law until the time of Solomon, when the size of the country was increased by conquest. The famous forests of the eastern Mediterranean lands helped to regulate the run-off from the mountains, maintain permanent springs, and prevent soil erosion. Timber from Mount Amanus, however, was exported to regions as far distant as Babylon before the beginning of written history. Phoenician ships were built of coniferous wood from Mount Hermon, and the early importance of both Tyre and Sidon was based largely on the lumber trade. Today, a few scraggling trees are all that remain of the famous forests of Lebanon, from which Hiram, King of Tyre, secured the cedar for Solomon's temple in Jerusalem.

The spread of farming to the hills was accompanied by the development of terrace agriculture, which in part compensated for the destruction of the forests. Around Antioch cultivation extended almost to the mountain tops, in Phoenicia slopes up to 5,000 feet were terraced for vineyards, and in Judea the remains of broad-based terraces used for barley production may still be seen.

The country around Antioch was famed throughout the ancient world for its choice oil and wine, which were exported via the Orontes River. At its prime, the population of the city numbered 400,000;⁶ the population today, including the military post, is but 28,000. In a few places, remnants of old terraces are still in use, but the hillsides are generally bare and rocky. During the winter rains, the trickling streams become almost impassable torrents; sediment is deposited on the valley floors; and muddy waters are carried far out to sea, where they provide a sharp contrast to the clear waters of the Mediterranean. In some places near Antioch, archaeologists have had to dig through 28 feet of sediment to uncover the remains of ancient buildings.⁷

Overgrazing probably followed closely upon the cutting of the forests, because the peoples of the eastern Mediterranean have always been dependent upon sheep and goats for meat, milk, wool for clothing, and skins for tents. Because level land was at a premium, the larger animals were a luxury reserved for

⁶ E. S. Bouchier, *A Short History of Antioch*, 13 (London, 1921).

⁷ Letter of William A. Campbell to H. H. Bennett, Oct. 8, 1934.

special feasts at which the entire animal could be consumed at a single sitting. As agriculture spread to the sloping lands, sheep and goats started on their "age long nibble up the mountains."

Overgrazing, however, did not become critical until the fall of Rome, when the Near East was racked by war. Without political security it was impossible to maintain irrigation works and terraces. Growing crops were easily destroyed by invading armies, whereas animals could be driven to places of security. The increase in the size of the flocks and herds was the direct cause of accelerated erosion. Sediment, washed down from the hills, covered the fields, blocked the river channels, and created swamps that served as breeding grounds for the malaria-carrying mosquito. A gradual migration of population from the lowlands to the hills followed, and even lowlands that could no longer be farmed were converted into pastures for sheep and goats.

Of all the eastern Mediterranean peoples, the Phoenicians had the greatest influence on agricultural progress throughout the ancient world. Because their country was mountainous, none of the Phoenician city-states produced grain in quantity, but they were unsurpassed in the cultivation of the olive and the vine. In addition, they were the craftsmen and traders of the ancient world, with commercial contacts extending from Persia to Britain. The two Greek heroes, Cadmus and Hercules, traditionally derived their agricultural skill from Phoenicia. When Hercules cleaned the Augean stables and slew the Hydra, he was confining the untamed waters into channels where it could supplement rather than destroy the works of man. These legends are the first accounts of irrigation in Greece.

The earliest known inhabitants of Greece had been pastoral people. The hilltops were wooded and the slopes covered with soil. With the improvement of agriculture, the Greeks also became farmers but never produced an abundance of grain. The increasing population created a need for new sources of food, and the Greek colonies established throughout the Mediterranean region were usually grain producers or stations along the routes of grain trade. The mountain forests of Greece were cut to provide timber for ships, and erosion and sedimentation became more pronounced. As early as the fifth century B.C., Xenophon commented upon the worn-out fields of Greece and the profit that might be secured by reclaiming them.⁸

The processes of erosion and sedimentation were well known to the Greeks. About 500 B.C., Hecataeus of Miletus described Egypt, probably for the first time, as the "gift of the Nile." In this case, the benefits of sedimentation far outweighed its disadvantages. The frequent occurrence of landlocked islands and promontories throughout the Aegean region indicates that both erosion and sedimentation were in progress there also. According to Greek legend, Alcmaeon was advised by the Pythian priestess to settle on newly formed land if he would escape the avenging furies. This he found on the delta of the Achelous River, which at that time carried so much sediment that all of the Echinades,

⁸ Xenophon, *Oeconomicus*, 20:22-26.

a group of islands near its mouth, were in danger of becoming landlocked. The process was never completed, and in the second century A.D., Pausanius attributed this to a radical change of land use near the headwaters of the river.⁹

The Greeks, however, did little to check erosion. As farming declined, sheep and the even more destructive goats increased in number. The *Anopheles* mosquito and the goat have always been allies. Sediment washed from the overgrazed hills clogged the stream channels and created swamps where the mosquitoes bred. Malaria became endemic in Greece about the fourth century B.C., and is still one of the major obstacles to progress. Erosion has been so serious that it is doubtful if the soils of Greece could ever again support a culture comparable to that of the past.

Whereas Greek agriculture borrowed from the older lands to the east, Carthage, a colony of Phoenicia, was a direct heir to its agricultural traditions. Although the land about Carthage was comparatively level, the vine and olive continued to be the chief crops. No more land was farmed than could be cultivated intensively and, until the time of the Punic Wars when extensive grain cultivation was forced upon Carthage, erosion apparently was practically non-existent.

The agricultural writings of Columella reflect the influence of Carthaginian agriculture in Spain, and the eighteen volumes of Mago the Carthaginian, which dealt chiefly with olive and vine culture, were the only Carthaginian writings ever translated by the Romans. As Rome expanded territorially after the Punic Wars, there was a shift from grain to vine culture in Italy. Thereafter, all of the contemporary writings on the subject of agriculture are based on the works of Mago.

The agriculture of the Italian peninsula, like that of Carthage, was stimulated by contacts with the older countries to the east. The earliest known people of this peninsula were pastoralists. The first contact with the agriculture of the east came during the thirteenth century B.C., when the Etruscans from Asia Minor settled on the west coast. Six hundred years later, Greek expansion to the east was checked by Sennacherib, King of Assyria, and the course of migration was shifted westward.

When the Greeks first settled in what is now southern Italy and Sicily, the mountains were wooded, and the lowlands were so fertile that the region became the granary of Greece. Archaeological investigations of Greek settlement provide the earliest direct evidence of accelerated erosion and sedimentation in this region. The word "sybarite," which means a lover of luxury, is derived from Sybaris, the wealthiest city of the Greek world. After two hundred years of prosperity, Sybaris was attacked and destroyed by the neighboring Crotonians in 510 B.C. With the abandonment of agriculture following the destruction of the irrigation and drainage systems, the waters of the Crati and Sybaris rivers were released. The lowlands were converted into marshes, and the city and surrounding land were completely buried by debris washed down from the

⁹ Pausanias, *Description of Greece*, 8:24.

mountains. Until a few years ago even the site of the city was unknown, and the malarial swamps and bare mountains around it gave no indication of the former productiveness of the region.¹⁰

Rome, itself, was originally a nation of small farms. It was a source of pride to Cincinnatus that, when summoned to lead Rome against the attacking Volsci during the fifth century B.C., the messengers found him plowing his 4 jugera (about 2½ acres) of land on the Vatican Hill. When the crisis was over he returned to his fields.

Good farming was regarded by the Romans as the highest of accomplishments. To attain this goal, Roman authors searched the literature of the past and of other countries in order that farmers might profit by wider experience. Cato, Varro, and Pliny built upon the works of their predecessors, and Virgil's works are a compendium of the best practices of his time. Farmers, however, were exhorted to experiment further in order to adapt the methods of cultivation to local soil and slope conditions. Although straight furrows, so prized by Cyrus of Persia and by the Greeks, were still considered a sign of good farming, Pliny recommended that on a hillside "furrows are to be drawn transversely only."¹¹ His description of their construction shows that the Romans of the first century B.C. had evolved a system of cultivation that amounted to field terracing similar to that in use today. Dry farming was the rule on land that could not be irrigated, and the plowed fallow was widely employed to conserve moisture. Virgil, also, described a simple form of rotation consisting of fallow, grain, and a leguminous crop, and the fertilizing effect of leguminous crops was mentioned by numerous writers.

After the Punic Wars, a period of empire building ensued. Farmers were conscripted for the army, and agriculture was relegated to slaves. Vine and olive culture increased, and cattle raising became more profitable than grain production. Small farmers were forced off the land by the establishment of large estates or *latifundia* devoted largely to grazing.

To compensate for the loss of grain production, free distribution of imported grain was initiated under the rule of the Gracchi. By the time of Caesar, over 200,000 people in Rome alone were receiving free grain, about a third of which came from North Africa. To meet this demand, the North African colonies were forced to produce maximum amounts of grain. This was probably the world's first example of deliberate large-scale land exploitation. Without considering the consequences on the land itself, organizations comparable to present-day syndicates were formed for the purpose of acquiring immediate wealth from the sale of grain to Rome.¹² By the time of Nero, in the first century A.D., six large landowners controlled half of the Roman land in North Africa.

The introduction of the camel as a means of long distance transport during the

¹⁰ A. C. Ringland, "Mussolini's Sybarites," *American Forests*, 39:291-297, 334 (1933).

¹¹ Pliny, *Natural History*, bk. 18:49.

¹² Paul-Louis, *Ancient Rome at Work; An Economic History of Rome from the Origins to the Empire*, 113-121 (New York, 1927).

Roman occupation of North Africa is roughly comparable to the westward extension of railroads in the United States. Grain for the market could be produced farther inland, and the produce from desert oases was made available to Rome. Much of the land brought under cultivation at this time had formerly been waste, and after the fall of Rome, it reverted to its earlier state. Sallust, the Roman historian of the first century A.D. and governor of Numidia, described the country traversed by Marius during the Jugurthine War of the first century B.C. Marius found that the people of Gafsa "were protected from their enemies by their fortifications, their weapons, and the number of their warriors, but still more by the difficulty of approach. For, except near the town, all of the rest of the country is uninhabited, uncultivated, waterless."¹³ Records show that during the three following centuries, this same area supported the cities of Cillium and Thleptus as well as some two hundred prosperous villages, surrounded by irrigated fields and groves of pistachio and olive trees. The remains of the groves and the ruins of oil presses may still be seen throughout a region that is today little more than desert.

Around Carthage, similar changes occurred under Roman rule. Extensive farming supplanted the intensive plantation agriculture characteristic of Phoenician Carthage, and in the third century A.D. the Christian priest, Tertullian, boasted:

Flourishing domains have effaced the most famous deserts, cultivated fields have conquered the forests, flocks have chased away ferocious beasts. . . . Certain proofs of the growth of human nature! We are in charge of the world. . . . Everywhere resounds this complaint: nature is going to disappear!¹⁴

With the fall of Rome, North Africa was ravaged by successive waves of Arabs and Vandals, during which the olive groves, fields, and irrigation works were deliberately destroyed. The increase in wind erosion, to a large extent, may be attributed to wanton destruction. However, a few scholars, including Gautier who is the greatest of modern authorities on the Sahara, are of the opinion that increased wind erosion followed by desert expansion was caused, in part at least, by agricultural overextension made possible by the introduction of the camel.¹⁵ Roman ruins also show that agriculture thrived in regions that are now wastes of blowing sand. The fact that all of the ruins are not of the same date would indicate that agriculture shifted even during the Roman era, although slave labor was available for building reservoirs and maintaining irrigation works. The area under cultivation at one time never equalled the total amount of land that had at some time or other produced crops for Rome.

The fall of Rome was followed by a period of agricultural retrogression throughout the Mediterranean world, but much of the agricultural literature was preserved in monastery libraries during the Middle Ages. The writings of

¹³ Sallust, *The Jugurthine War*, 89.

¹⁴ Quintus Septimius Florens Tertullianus, *De Anima*, ch. 30.

¹⁵ E.-F. Gautier, *Sahara, the Great Desert*, tr. by D. F. Mayhew (New York, 1935).

Mago, however, were completely lost and are known today only through quotation. In Spain the earlier traditions were preserved in the writings of the Arabs. "The Book of Agriculture" by Ibn al-'Auwām, written in the twelfth century A.D., includes not only the agricultural practices of Roman Spain and North Africa but also goes back into the past as far as the ancient Nabatheans. During the nineteenth century, it was translated into Spanish and French, and a cheap Spanish edition made it available even to farmers.

Roman agricultural precepts were again revived in England after the thirteenth century. By this time, the weaving industry had become important in Flanders, and because English wool was, for some purposes, preferred to the Spanish, pressure was exerted to increase wool production. Simultaneously, English towns were growing in population and importance, but agriculture of the type then existing could not supply the needs of the market. The first agricultural improvements were inspired and initiated by the great ecclesiastics of the time, who were familiar with the agricultural writings of the Romans. The Monastery of Colechester translated the works of Palladius into English rhyme; the "Rules" for the management of a manor are commonly attributed to Robert Grosseteste, the Bishop of Lincoln; and Walter of Henley, who wrote extensively on agriculture, was a Dominican. Roman ideas were superimposed upon Saxon agriculture.

In Spain, the climate resembled that of Italy and North Africa, and similar methods of farming could be employed satisfactorily. Roman agriculture, however, was less well adapted to North Europe with its heavier rainfall. For example, in England the fallow was a survival from an earlier type of agriculture in which the land was cropped until exhausted and then allowed to lie idle to recover. In the Mediterranean region, it was employed to conserve moisture. The two types of fallow were easily confused, and the emphasis that the Romans placed upon the fallow was responsible for its persistence in England long after wet-land agriculture made it unnecessary.

Although Roman sources provided the incentive for agricultural improvement, rapid progress was delayed until English agricultural leaders began to apply practices that had been developed nearer at hand in regions where the climate resembled their own. In Flanders, the growth of industry had been accompanied by a corresponding advance in agriculture directed toward the increase of crop yields in a humid region with sufficient moisture for farming at all seasons of the year. The use of root crops and lucerne, which eliminated the need for the fallow, and the consequent introduction of scientific crop rotations were a direct result of Flemish influence. In England, the experience of Flanders was supplemented by experimentation, in order to perfect the borrowed techniques. By the latter half of the eighteenth century, England had become the agricultural leader of Europe. English farming systems spread back to the Continent, where they slowly progressed eastward, and were disseminated throughout the countries of the New World.

In the New World, European farm practices were seldom perfectly adapted

to climatic and physiographic conditions, but settlement proceeded so rapidly that experimentation, of necessity, lagged. Rapidly accelerated erosion is one of the indications of incomplete adaptation in the United States, but, in general, we continue to use methods of farming that were developed in Europe. Although evolved locally, European agriculture was based on experience that had come down through the ages and from remote parts of the world. Erosion, like agriculture, has its roots in the past, and its processes are regionally interdependent because many of them were set in motion by the introduction of crops and farm practices from other regions.

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SUBSIDIZED HEMP PRODUCTION IN SPANISH CALIFORNIA

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Hemp raising in Spanish California occupies a brief but interesting chapter in the economic annals of the province.¹ Confined to the closing decade of the eighteenth century and the opening years of the nineteenth, cultivation of hemp in California was entirely dependent upon a government subsidy program. The importance of hemp cannot be judged by present-day standards, for it has been largely displaced in many uses by competing fibers or other products. Its use for ships' rigging alone, however, was sufficient to justify the solicitude with which the European powers of early modern times attempted to encourage its production at home and in their colonial possessions. The hemp plant had further advantages as a colonial crop; it was adapted to a wide variety of climatic and edaphic conditions, and could be raised and processed by crude methods.

As early as 1545, the Spanish viceroys and other officials in the New World were ordered to encourage the raising of both hemp and flax.² In the same year, hemp from Spain was introduced into Chile, and subsequently, it was taken up by other Spanish colonies.

In the latter part of the eighteenth century Spain was desperately trying to revitalize her decaying economy. In this period of economic reform, those policies were especially favored which shaped colonial productive efforts to meet Spanish needs. Hemp had a definite place in this program, since production in Spain itself was inadequate to meet domestic requirements, and accordingly steps were taken to increase colonial output. In 1777, a number of men qualified to teach methods of raising and preparing hemp were supplied with seed and implements and sent to various Spanish possessions in America. Even before this, Spain had admitted colonial hemp free of duty and had allowed the manufacture of hemp products in the colonies. In 1780, possibly because of the war with Great Britain, the Spanish crown issued another order enjoining officials in the American colonies to encourage hemp production. This led the colonial government in Mexico to offer to purchase all the hemp produced within its jurisdiction, although producers were still at liberty to seek buyers wherever they wished. Prizes were offered for the best processes to prepare hemp. Finally, it was decided that California, of the several provinces in the Viceroyalty of Mexico, was the one in which hemp raising should be particularly stimulated. To do so would not only increase the supply of a much-needed product, but would also enhance the economic development of the province.

At first, an attempt was made to induce the California missions to raise hemp, since they were the principal agricultural enterprises in the colony. The mis-

¹ The material used in this article was obtained in connection with a larger investigation which was made possible by a fellowship of the Social Science Research Council.

² *Recopilación de las leyes de las Indias*, book 4, title 18, law 20 (Madrid, 1756).

sions of California (then known as Upper, or New, California) were under the administration of the Franciscan Colegio de San Fernando in Mexico City. In September 1793, the Viceroy wrote a letter to the head of the Colegio, Father Pangua, in which he stressed the necessity of raising hemp to provide rigging for Spanish vessels on the Pacific. Father Pangua, in turn, wrote to the president of the California missions, Father Lasuén, urging the missionaries to cultivate hemp and ordering them, as a preliminary step, to inspect their lands with a view to ascertaining the areas most suitable for this purpose.³ However, it is doubtful that the missionaries actually took any steps to plant hemp at this time. About a year later, Father Pangua promised to send hemp seed to California, but there is no record of any such shipment. Furthermore, the mission crop records do not show that hemp was produced in these years. There is a noticeable lack of enthusiasm in the mission correspondence concerning hemp; the friars probably preferred to concentrate their efforts on raising food crops and livestock.

The first experiments of any consequence in California, therefore, were conducted under civil auspices. In the summer of 1795, the Viceroy forwarded to the Governor of California a copy of instructions for raising and processing hemp, written by an expert in Mexico. The Viceroy was probably stirred into action at this time by a report from the naval base of San Blas.⁴ According to this report, ships at San Blas were fitted with rigging made from the fiber of the agave plant, known as pita. Annually about 4,800 arrobas (approximately 120,000 pounds) of the fiber were purchased, at 2 pesos per arroba. Cables made from pita lasted only one voyage; other articles of the same fiber lasted two to three years, but were then discarded since they could not be used for any other purpose. In contrast, cables made from hemp would serve for three to four years and could then be used for minor purposes. A final use was for oakum, in calking. Thus, the report concluded, even though hemp cost twice as much as pita, it was still cheaper to use than the latter.⁵

The Governor of California, Diego Borica, took up the hemp program with enthusiasm. He ordered the commanders of all the presidios to acquaint settlers with the advantages of raising hemp, and, if necessary, to make small cash loans and supply oxen to hemp producers. An experiment was undertaken at government expense at San Jose, a town near the southern end of San Francisco Bay. Apparently, no one adept at hemp cultivation was available, and the experimental work was conducted by a soldier who knew something of flax culture. The first year's crop, harvested in the fall of 1796, amounted to 5½ fanegas or about 14 bushels. Borica was encouraged by the yield, but a sample sent to San Blas was found unsuited to maritime needs, because of unsatisfactory

³ "Archivo de la misión de Santa Bárbara," 12:13-15 (MSS., Bancroft Library, University of California, Berkeley, California).

⁴ San Blas, on the west coast of Mexico, was an important naval base and the home port for the California transport service.

⁵ "Departmental State Papers, San José," 1:56-58 (MSS., Bancroft Library).

processing. A sample of the 1797 crop was given the same rating, and the naval officials at San Blas refused to state a price at which they would buy California hemp.

By the following year, Borica was confident that the quality of the California product had been considerably improved. Writing to the Viceroy in October 1798,⁶ he stated that he was shipping 25½ arrobas (about 640 pounds) of hemp to San Blas, to be paid for out of royal funds. Since no price had yet been established, Borica asked that it be fixed at 3 pesos, 4 reales per arroba, in order to induce settlers and missions in California to expand production. Furthermore, he suggested that payment be made upon delivery at the transport vessel, as the California producers lacked sufficient capital to advance freight charges. Borica's enthusiasm, however, found no counterpart at San Blas. A few months later a report was forwarded to the Viceroy to the effect that the California hemp was still improperly cultivated and inadequately treated, that it could not be satisfactorily employed on ships, and that it was suitable only for wicks.⁷ The price asked by Borica was deemed too high for the quality of the product; as it stood, it was cheaper to continue using pita. The San Blas officials felt that the experiment should be continued, however, and suggested that one of their gunners, Joaquín Sanchez, be sent to California to instruct the inhabitants in better methods of cultivating and preparing hemp. Sanchez, it appears, had raised hemp in the Province of Granada, in Spain.

The suggestion to send an expert to California was well received in Mexico City, but so ponderous was the Spanish administrative machinery that almost two years elapsed before Sanchez was ordered to go. At the same time, it was provided that the captains of the transport vessels serving California were to purchase all the hemp of suitable quality offered, and to pay for it in cash.⁸ The price, however, was not specified.

Between the time Sanchez was ordered to California and his actual arrival another year passed. A number of time-consuming details had to be arranged in the colonial administrative set-up. A special salary of 15 pesos monthly was granted to Sanchez, a traveling allowance provided, and a number of agricultural implements were purchased and turned over to him. These implements, including hoes, plowshares, machetes, sickles, and hackles, cost 385 pesos. In the meanwhile, the hemp crop of 1800 was shipped to San Blas. Smaller than expected, it aggregated about 800 pounds. The amount harvested in 1801 does not appear in the records examined by the writer.

Upon arriving at Monterey in September 1801, Sanchez decided to confine his operations, for a time at least, to San Jose. He found the region well adapted to hemp and the inhabitants eager to raise it, if they could get enough seed. Their methods of cultivation, however, were inefficient. No record of the 1802 crop has been preserved, but in the summer of 1803, Sanchez reported that the

⁶ Archivo General de la Nación, Mexico, "Provincias internas," 16.

⁷ *Ibid.*

⁸ *Ibid.*

hemp sown in March of that year was doing very well. Harvested in the fall, it amounted to over 450 pounds. From this crop Sanchez gave to the settlers of San Jose about 18 bushels of hemp seed, to be sown the following spring. The cumulative results, however, were exceedingly disappointing, and Sanchez began to doubt the possibility of putting hemp on a profitable basis in California.

Writing to the Governor in August 1804, Sanchez summarized the factors which were holding back hemp cultivation in the province. Most important of all was the low price. The pursers of the transport vessels were not competent to appraise the quality, and the price they had fixed—3 pesos per arroba—was too low. It barely met the expenses of raising hemp, while the cost of processing was not covered. With no other outlets available, the producers were forced to accept this price. Moreover, the Californians were lazy and inefficient, and could not be counted on to raise much hemp under any circumstances. The only encouraging thing in the whole situation was the fact that the missions were becoming interested in the crop; once started, they had the means to raise it on a large scale. In order to encourage them to do so, Sanchez suggested that a few bushels of seed be distributed among three of the southern missions, San Luis Obispo, Purisima, and Santa Ines.

The hemp crop of 1804 was very small, about 150 pounds. Too much fog at a critical time was held responsible for the failure to process a larger amount. About 50 bushels of seed were distributed for the following year, more than half going to the mission of San Jose. A few bushels were sent to the three missions named above, and the balance was turned over to individual settlers.

Sanchez's complaint regarding the low price of hemp bore fruit. In March 1805, treasury officials decided that hemp raising in California was, for the time, a subsidy problem. Consequently, it was suggested to the Viceroy that the entire annual crop should be purchased at a price that would cover all costs and yield a profit to the producers; quality should be a minor consideration.⁹ This recommendation was accepted by the Viceroy and embodied in an order issued the following month. No specific price was fixed by the edict itself; instead, a flexible arrangement was adopted whereby the Governor would determine the price on a "cost plus profit" basis. How much "profit" he was to allow was not indicated.

Shortly after receiving the Viceroy's order, Governor Arrillaga, the successor to Borica, raised the price of hemp to 3 pesos, 4 reales per arroba. Apparently, he consulted Sanchez before setting the new price. The higher price did little immediate good, however, as the 1805 crop was pitifully small. Weather conditions were bad, and the crop actually raised was almost entirely destroyed by fire. Only about 150 pounds were salvaged.

Late in 1805, Sanchez shifted his headquarters to Santa Barbara, in order to activate hemp raising in southern California. By this time, he felt, he had done as much as possible to instruct the inhabitants of the San Jose-Monterey

⁹ "Provincial State Papers," 19:52 ff. (MSS., Bancroft Library).

region; furthermore, he was convinced that the southern part of the province offered greater opportunity for expansion. The move was a wise one, for California hemp production began to mount strikingly. In November 1806, over 1,800 pounds were shipped to San Blas, including a remnant of the 1805 harvest.

Further encouragement was given the following year when the price of hemp was raised to 4 pesos per arroba. This was done mainly to cover the cost of transporting hemp raised in the Santa Barbara district to a point of embarkation for San Blas. In 1807, the crop aggregated 12,500 pounds, with almost 40 percent of the output originating in the Santa Barbara area. The Los Angeles district was second, closely followed by the San Jose-Monterey region, while the San Francisco area supplied only 1,250 pounds.

From 1807 to 1808 the crop increased approximately 150 percent, reaching a total of 30,750 pounds. The southern part of the province, which had taken up the crop with eagerness, was now producing not only the greatest quantity but also the best quality of hemp. The Los Angeles district alone accounted for approximately 70 percent of the 1808 product. In the spring of the following year, some residents of Los Angeles protested that too much of their water supply was being absorbed in hemp raising, leaving an insufficient amount for other crops. The protest was without effect, since the Government was still very anxious to stimulate hemp production.¹⁰

The success of the subsidy program can be gauged from the striking increases in production in 1809 and 1810. The 1809 crop of 123,000 pounds was four times that of the preceding year, while in 1810 almost 220,000 pounds were raised. These increases were largely due to the mission output, which amounted to two-thirds of the 1810 total.

There is every reason to believe that hemp production in California would have continued to expand after 1810. The outbreak of the independence movement in Mexico, however, virtually made California an isolated province. Transports came less frequently, and, finally, not at all. As early as February 1811, the Governor ordered Sanchez not to push hemp cultivation in excess of local needs; the Government would try to insure producers against loss on hemp already raised but would not obligate itself to purchase future crops. Withdrawal of the subsidy effectively put an end to hemp raising in Spanish California. The missions continued to produce small amounts for their own use, but commercial production was not resumed.¹¹

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¹⁰ *Ibid.*, 19:264.

¹¹ "Archivo de la misión de Santa Bárbara," 12:88.

LAND INHERITANCE UNDER THE SWASTIKA

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The German Entailed Farms Law of 1933 has probably aroused more interest in foreign countries than any other part of the Nazi land policies. It gives preference to one heir who is called the *Anerbe*, a word which literally means the "next heir." His holding is called the *Erbhof*, or entailed farm, and the institution of entailed farms is expressed by the concept of *Anerbenwesen* or *Anerbenrecht*, which has been replaced by the somewhat plainer *Erbhofrecht*. Inheritance by one child is the outstanding feature of the entail. This type of inheritance is also sometimes called *geschlossene Vererbung*, or "closed" inheritance, in contrast with other systems where the farm is divided among the heirs. Besides these two systems—the divided and the undivided land inheritance—a third may be mentioned. Instead of dividing the farm, the heirs sell it and divide the proceeds. This procedure is seldom used in Europe, but probably in France more than anywhere else.

Several investigations, initiated by Professor Max Sering, show the customary application of closed inheritance among the estate owners of Eastern Germany and among the owners of large estates generally, especially among the nobility.¹ The division of real property predominated among the peasants of the Upper and Middle Rhine and its tributaries, where small holdings with very intensive cultivation are favored by climate and soil conditions. The German civil code of 1896 provided for free division of land among the heirs. As in France, the freedom to bequeath real property at will was accompanied by a system of "compulsory portions." Their amount, however, was smaller, and there was not an aversion to farm indebtedness comparable to that in France. Many farmers, therefore, preferred to keep the farm as a whole and pay off the other heirs in cash or by mortgage. Both methods resulted in indebtedness, but too unsound a degree of dispersion was prevented.

Even before the Nazi upheaval, closed inheritance was provided by statutes in the northwestern part of the Reich. Yet it was the farmer himself who ultimately decided whether or not his farm should become an entail, just as the closed inheritance in other parts of Germany was based on custom, but never on compulsion. The extent to which closed inheritance prevailed in Germany before the new legislation has been estimated at two-thirds of all farm land.² Other estimates give four-fifths for the Reich and thirteen-fourteenths for Prussia,³ but these figures are only rough estimates. An investigation by the

¹ Max Sering, ed., *Die Vererbung des ländlichen Grundbesitzes im Königreich Preussen* (Berlin, 1897-1910. 14 v.); Max Sering and Constantin von Dietze, eds., "Die Vererbung des ländlichen Grundbesitzes in der Nachkriegszeit," *Verein für Sozialpolitik, Schriften*, Band 178 (München, 1930).

² Friedrich Aereboe, *Agrarpolitik*, 259 (Berlin, 1928).

³ Gustav Wagemann and Karl Hopp, *Reichserbhofgesetz*, 45 (Berlin, 1933).

Prussian census bureau shows that the ratio of divided farms to undivided farms, by size groups, in Prussia, about 1920 was as follows: farms of 2 to 5 hectares, 31 percent; farms of 5 to 20 hectares, 9 percent; farms of 20 to 50 hectares, 3 percent; farms of 50 to 100 hectares, 1.7 percent; and farms of 100 hectares or more, 1 percent.⁴ Although limited to holdings with over 2 hectares and not covering many parts of Germany where division of inherited land is prevalent, the data confirm the fact that closed inheritance prevailed among the owners of the larger farms, while there was a large number of small holders who divided their farms. One quarter of all German farm holdings averages 2 to 5 hectares.

It should be emphasized again that the institution did not rest on compulsion and that the farmer could bequeath his farm to the son who appeared to be best fitted. Exclusive predetermination by birth existed only among the nobility. The following data relating to selected districts in Württemberg indicate the percentage distribution of heirs of farms by birth: Oldest son—1865-1889,—57.8; 1890-1914,—54.5; 1915-1934,—49.3. Youngest son—1865-1889,—21.1; 1890-1914,—23.4; 1915-1934,—21.8. Another son—1865-1889,—21.1; 1894-1914,—22.1; 1915-1934,—28.9.⁵ These figures indicate that a growing number of farmers were abandoning the irrational selection of a predetermined heir.

In Germany the difference between closed inheritance and division of inherited land and the regional distribution of these systems are connected with the type of land settlement. Where the farms are separate, the inheritance is usually closed; and where the peasants are settled in villages, the inherited holdings are often divided.⁶ Ultimately, the difference in the inheritance is of historical origin. The control of the manorial lords over the holdings developed differently in the various regions. The lords maintained control in the East and in the Northwest for a longer period than in other parts of Germany where the rights of the peasants grew strong at a comparatively early time. In the present century, the division of inherited land has taken place chiefly in Central and Southern Germany, where manorial control disappeared at an early date. Closed inheritance, on the other hand, continued in the regions where the peasants became owners comparatively late. "It is the good property right which makes the division of land possible. Property and free divisibility belong together, while closed inheritance was, in the main, intended to serve the manorial lords."⁷ When the peasants were freed, they were given the right to distribute their newly won property among their children.

Outstanding historians have drawn the further conclusion that closed inheritance is a product of the manor and feudalism. Much may be said in favor of this opinion even though it was opposed by the romantic and reactionary faction of the German economists and historians. These scholars favored

⁴ Höpker, "Der Besitzwechsel in Preussen während der Jahre 1896 bis 1921," *Zeitschrift des Preussischen Statistischen Landesamts* (1922), 62:1-93.

⁵ P. Brugger, "Der Anerbe und das Schicksal seiner Geschwister," *Berichte über Landwirtschaft* (n.s.), Sonderheft 121, p. 23 (Berlin, 1936).

⁶ C. J. Fuchs, *Die Epochen der deutschen Agrargeschichte und Agrarpolitik*, 17 (Jena, 1898).

⁷ *Ibid.*

paternalistic bonds and dependencies and therefore sought to make closed inheritance more popular. They tried to prevent its savoring too strongly of feudalism and to revive it by discovering more attractive features which could be emphasized. Thus, closed inheritance and primogeniture were heralded as ancient institutions of the Germanic tribes which had been established long before feudal times. To be sure, the old laws provided the contrary, as, for instance, the law of the Saxons, or the law of the Bavarians which said that "brothers divide equally."⁸

The vigorous efforts to reestablish the entail during the nineteenth century were not successful. If the peasants used the scheme at all, it was only to a negligible extent. When the civil code for the Reich was enacted, there were many attempts to secure provision for closed inheritance. They failed, however, for they were resisted by a large number of outstanding scholars like Lujo Brentano, Theodor von der Goltz, Adolf Buchenberger, Karl Bücher, and many others who combined social conscience with a wide knowledge of economic history and advanced sharp opinions against the creation of inheritance legislation which was destined to separate a single estate from the national community.⁹ At this time, the defenders of closed inheritance did not ask for more than a legal scheme to which the farmer could have recourse if he intended to pass the farm over to one heir. There were, however, some who advocated the automatic application of such a scheme to all farms so that the farmer who did not want to apply it would have to state his intention in some legal form. This was, perhaps, the most extreme demand advanced at this time. It was based on the observation that the German farmer, in general, has an almost insurmountable aversion to making his testament or dealing with the authorities in matters pertaining to inheritance. Compared with the present legislation, these attempts of forty-five years ago were very moderate. Nobody dared to advocate compulsory entail. Professor Max Sering said: "I do not know of any living man who defends compulsory entails, who would want to fall back upon the medieval law of the estates which made the peasant holdings closed units and which excluded the free disposal of the owner and testator."¹⁰ Thus was prevented the fulfillment of wishes, which, according to Karl Bücher, were directed toward "the intruding of a compact class of satisfied people between the many who are not satisfied with their situation,—a class of people who unconditionally lend themselves to be led by the classes hitherto authoritative."¹¹

The attempts to revive closed inheritance were renewed in the twentieth century. After the Great War two German States enacted laws which, although voluntary, could be applied by the farmers. When the Nazis came to power they could choose between various possible forms of entail. They could provide

⁸ Lujo Brentano, *Agrarpolitik*, 216 ff. (ed. 2, Stuttgart, 1925).

⁹ Cf. "Das bäuerliche Erbrecht," Verein für Socialpolitik, *Schriften*, 61:239-404 (Leipzig, 1895).

¹⁰ *Ibid.*, 300.

¹¹ *Ibid.*, 333.

that the scheme was to be applied only after the farmer had declared his intention to entail the farm, as in Denmark, or they could raise the scheme to a law automatically prevailing in all cases of succession among the peasantry. As regards the latter possibility, they could permit the farmer to exclude the application of the scheme by his will or by some other act, as in Switzerland and Czechoslovakia; or they could make it compulsory. They have chosen the latter way. In doing so, the Government and the men behind the new legislation have often stated that they regard the Norwegian legislation as the model for the German.

The Nazis evaluate Scandinavian institutions as precious relics of the Germanic spirit which they cherish so fondly, and they went so far as to give a new and leading magazine in the field of agricultural policy the title *Odal*, as a reminder of the Norwegian Odel law. This *Odels og Aasaetesrett* rests upon very ancient Norwegian institutions which were incorporated in a statute in 1821.¹² The *Odelsrett* provides for a redemption right which is given to members of a family, if the holding was in their hands for at least twenty years. If such a holding is sold, near relatives of the former owner may repurchase it. The redemption right has the effect of an encumbrance on the holding, and *odel* holdings are sold at lower prices than other holdings because the buyer deducts the negative value of the risk that redemption may be claimed.

The *Aasaetesrett* is a mere primogeniture. The eldest son inherits the farm which may not be divided unless the holding is sufficient to maintain several families. In this case the eldest son receives half of the holding, and the disinherited brothers and sisters have a right to liberal compensation. When the mortgage banks were established in Norway during the nineteenth century, many farmers began to suffer from heavy indebtedness, as they still do today, especially during the deflation after the Great War. Many Norwegians are anything but satisfied with these ancient institutions which drove many of their people across the Atlantic, and which proved a check on the country's economic progress. Several attempts were made to do away with both institutions, but this proved impracticable, since they are protected by the Constitution of 1814 which prohibits their abolition.

The German Entailed Farms Law of September 29, 1933 was enacted by decree, and replaced a corresponding Prussian law which had been enacted for Prussia a short time after the new regime had come to power. Later, similar measures were enacted in the Free City of Danzig. The drafters of the measure tried to provide a brief and popular law, and as a result, it is one of "basic principles" which can be amended by executive decrees. No less than three such decrees became necessary within the first six months of the new legislation. In spite of many official statements to the contrary, the authorities were not well satisfied with many effects of the legislation, and they took refuge in two new

¹² J. Frost, *Das norwegische Bauernrecht* (Jena, 1938). Knut Robberstad, "Le droit successoral dans les héritages ruraux et les expériences faites dans les différents pays," *Annales de la Commission Internationale d'Agriculture*, 16:137-150 (Paris, 1936).

executive decrees on December 21, 1936 which revoked the preceding three. Every state intervention necessarily produces a new and wider intervention, so an increasing number of rules and regulations had become necessary. The new decrees cover a number of pages tantamount to about one-sixth of the whole civil code. Even in Germany there are some critical comments on the form of the legislation: "The distinctness of the legislation has very much suffered from this inflation. Unfortunately the decrees are not understandable by themselves in many respects; even if one has recourse to the Entailed Farms Law, much remains obscure. . . . The form of the entailed farms legislation, as placed before us now, is not yet satisfactory on the whole."¹³

Farms, according to the law, become entailed if they meet the following five requirements: 1. They must represent an *Ackernahrung*, that is, an amount of land sufficient to maintain a family independent of the conditions of the market and the general business situation, and sufficient to maintain the management of the farm. This provision excludes, in general, all holdings which are under $7\frac{1}{2}$ hectares and which form the great majority of all farms in Germany. Likewise excluded are the so-called *Kleinsiedlungen*, or small settlements, and the many part-time farms whose size does not meet the requirement. The size limit varies in accordance with the conditions of the land; while 2 hectares may be sufficient in the fertile Rhine Valley, 10 hectares may be insufficient in the eastern parts of the Reich.¹⁴ 2. The upper limit is expressly stated by the law: entailed farms must be under 125 hectares (309 acres). While the lower limit is an absolute requirement, several provisions enable the Secretary of Agriculture to raise the upper limit in special cases if he wishes to do so. 3. The same holds good with respect to the further requirement that the farm can be managed without *Vorwerke*; the farm has to be an administrative unit without "out-works." This requirement, too, excludes the larger estates from becoming entailed, unless the Secretary of Agriculture makes an exception. 4. Furthermore, the holding which is permanently rented cannot become an entailed farm. The close connection between the peasant working on the soil which he owns and the land is missed there. Such permanent tenant farms, it is said, are nothing better than pure capital investments. 5. Finally, the owner of the holding has to be a person "capable of being a peasant." This capacity is given if the farmer meets five more requirements. He has to be a German citizen, also in the racial sense; he has to be of good repute and must enjoy his full legal status; and he must be in a position to run the farm properly. The last requirement does not mean that the owner of the entailed farm has to be an agriculturist. The farm may be operated by a manager, but the owner must be the master who ultimately decides on the management.¹⁵

Recently, a further requirement has been added according to which no holding

¹³ Karl Blomeyer, "Neuerungen im Erbhofrecht," *Jahrbücher für Nationalökonomie und Statistik*, 146:452-453 (Jena, 1937).

¹⁴ Wagemann and Hopp, *Reichserbhofgesetz*, 50-51.

¹⁵ H. Dölle, *Lehrbuch des Reichserbhofrechts*, 24-25 (München, 1935).

can become an entailed farm in the future if the debts of the owner exceed 70 percent of the taxable value of the farm. This requirement is interesting chiefly because of a significant exception. When farms over 125 hectares are admitted to become entailed, their indebtedness may amount to any percentage whatsoever. This provision again illustrates how much favor the Nazis show the large landowners. The creditor of an entailed farm can do virtually nothing to enforce his claim. As a result, an indebted member of the landed gentry can get rid of his debts from one day to another if the Secretary of Agriculture wishes to extend this favor to him.

If all these requirements are fulfilled the farm is legally regarded as an entailed farm, whether the owner likes it or not. Once an entailed farm, always an entailed farm. The farmer has no authority to change the legal status of his holding. He is not permitted to deal with his land according to his wishes. "The entailed farm is not your 'free', that is, desecrated property; you have to listen to the blood which rolls in your veins and which will roll in your children for the centuries."¹⁶ Thus the owner of an entailed farm may neither sell nor otherwise alienate his land or parts of it unless the authorities permit him to do so. Likewise he needs permission if he wants to rent his land. Entailed farms cannot be foreclosed; thus, nobody dares to mortgage them, and the farmers have to rely upon Government credit and personal loans.¹⁷

In addition, the freedom of the entailed farmer is further restricted by other provisions which threaten to deprive him of the rights and liberties still left to him. These provisions did not prove efficient, and they have been amended recently. Four different procedures can be followed by the authorities. 1. If they hold that the farmer's management is not satisfactory or that he does not meet his obligations, they may empower a neighbor or somebody else with the control of the management. 2. Instead of empowering the neighbor, the authorities may appoint a trustee who administers the farm for the owner. Both these types of interference with the management of the farm may be applied only temporarily. They can, however, be renewed. The transition to the definitive deprivation of the farm is represented by the next method which may be applied temporarily or permanently. 3. If the farmer has lost his "capability of being a peasant" or if he does not meet his obligations although able to do so, the authorities may deprive him of the administration and the revenue of his holding, and they may put one of his relatives in his place. The authorities may even go as far as to designate this person as the heir of the entailed farm. Such an expropriated farmer has no claim to maintenance on the farm unless he works under the new master's rule. 4. The same holds good

¹⁶ R. Freisler, in Wagemann and Hopp, *Reichserbhofgesetz*, 38.

¹⁷ The farm credit problem is not considered in this paper. For information, see A. R. Herrmann, "Erbhof und Kredit," *Zeitschrift für die gesamte Staatswissenschaft*, 95:719-741 (Tübingen, 1935); Herbert Timm, "Zur Erbhofkreditfrage," *ibid.*, 98:456-497 (Tübingen, 1938); K. E. Mössner, *Das landwirtschaftliche Geschäft der Hypothekenbanken* (Berlin, 1937).

when the *grosse Abmeierung* takes place. This is the harshest step to which the authorities may have recourse. It implies the definitive transfer of ownership, without indemnification for the dispossessed farmer, to a person appointed by the Reich Leader of the Peasantry.

All these provisions, important as they may be, are not regarded by the sponsors of the legislation as the most outstanding feature of the statute. As contrasted with the German civil code of 1896, the new legislation prefers one heir and discriminates against the others. If the farmer dies, the entailed farm devolves on the *Anerbe* while the remainder of his property passes to the heirs as determined by the civil code. In addition, these heirs have to pay the farm debts.

Who, then, is the *Anerbe*? In general, one of the sons; if there are no sons, the father, or one of the brothers, daughters, sisters, or other relatives of the deceased. No person virtually eligible to inherit the farm shall become the *Anerbe* if he already has another entailed farm. The legislation prefers that the youngest son become the *Anerbe* unless custom and tradition provide otherwise. This is done in order to enable the farmer to endow his older children, with whose interests the legislation interferes. To be sure, the children have a claim to maintenance on the farm and to education until they come of age. In addition, they may claim a vocational training and an endowment, the claims, however, being restricted by the legislation to an amount the farm can bear. No figures are as yet available concerning the fate of the children disinherited by the new legislation.

A study of the occupations of the brothers of the principal heirs in Württemberg during 1915-1934 shows the following percentage distribution: on the home farm, 10.7; entrepreneurs, 44.3; public officials, 10.0; clerks, 6.1; wage earners, 20.5; emigrants, 3.4; unknown, 5.0. For Pomerania during 1924-1929, the percentage distribution was as follows: on the home farm, 16.2; entrepreneurs, 47.3; public officials, 12.5; wage earners, 20.4; emigrants, 3.6.¹⁸ When these studies were undertaken, the children who left the farm received their share of the inheritance in cash or in mortgage; now their fate will be much worse. On the other hand, farmers no longer have to mortgage the farm in order to compensate the heirs who have gone away. However, as Professor Aereboe once said, this method of wiping out the farmer's debt "is like jumping out of the frying pan into the fire."¹⁹ Before the new legislation, the brothers and sisters who had left the farm could rely upon their claims when they were in want. Now they are permitted to come back to the farm, where they have to work for their living. The law goes as far as to make this right dependent upon their "innocently" being in want.

¹⁸ Brugger, "Der Anerbe und das Schicksal seiner Geschwister," 60-62; W. M. Frhr. von Bissing, in Sering and von Dietze, *Die Vererbung des ländlichen Grundbesitzes in der Nachkriegszeit*, 1:95.

¹⁹ Aereboe, *Agrarpolitik*, 509.

The treatment of the children who leave the farm is a regression to the feudal time when the farmer had no property right in his land. The reason for this discriminatory treatment in feudal times has been explained by G. F. Knapp, the outstanding historian of land tenure in Germany: "The reason for not paying compensation was not to preserve the farm free from debt. It was not for reasons of expediency that the brothers and sisters had to go away empty-handed; it was so because a compensation would have had no legal sense whatsoever. For the farm was not considered anyway the property of the family like an amount of saved money. Legally the farm belonged to the feudal lord! All the peasant had was a right to use somebody else's land; and this right to use had become hereditary."²⁰ Today the Nazi régime has taken over the rôle of the feudal lord.

Many farmers tried to avoid the Entailed Farms Law, or sought recourse in illegal agreements which favored the disinherited children; many *Anerben* proved more righteous than the law, and supplied their brothers with additional means.²¹ The general feeling of the populace is illustrated by the fact that "there is an avalanche-like rise in complaints to the Reich Court for Entailed Farms."²² In view of the well-known fact that there is no open criticism of Government measures in Germany the following veiled statement is not without interest: The Entailed Farms Law which "brings about harsh results in a great many individual cases had to give rise to many grievances of the peasantry; and it is natural that the great number of complaints which do not seem to be unjustified easily led to the conclusion that the whole legislation is a failure."²³ No wonder the number of entailed farms does not come up to the expectations of the Government. The legislation was expected to establish one million entailed farms. Later, the estimates became more moderate, and the expected number was reported as 845,000 farms. This estimate, however, still proved too high. Only 662,000 farms were recorded in the entailed farms register up to April 1937. The actual number may be about 5 percent higher, but no more. This means that about 20 to 25 percent of all farms are entailed.²⁴

The defenders of undivided land inheritance assert that the division of inherited farms makes the holdings smaller and smaller, so that finally they are no longer manageable. This charge has never been proved; on the other hand, many experts have shown that it is not correct. As Professor Sering said: "Every marriage connects two heirs of land. Holdings are permanently broken

²⁰ G. F. Knapp, "Die Grundherrschaft in Nordwestdeutschland," in *Ausgewählte Werke*, 1:199 (München, 1925).

²¹ W. Herschel, "Geheime Nebenabreden und freiwillige Leistungen im Erbhofrecht," *Recht des Reichsnährstandes*, 1936, p. 283 ff.

²² *Westdeutsche Zeitung*, July 20, 1935.

²³ Blomeyer, "Neuerungen im Erbhofrecht," 469.

²⁴ The first estimate is from "Die deutschen Erbhöfe," Berlin Institut für Konjunkturforschung, *Wochenbericht*, 7:56-58 (1934); the second from "Die Erbhöfe im Deutschen Reich," *Wirtschaft und Statistik*, 14:806-808 (1934). The registration figures are from *Recht des Reichsnährstandes*, 1937, p. 629.

up, and many heirs sell or rent their portion. Thus there is always opportunity to acquire land."²⁵

Another reason which is often given in favor of closed inheritance rests upon the observation that the division of the holding depreciates the farm buildings. Why not alter the buildings, if land utilization, thus, can become more intensive?²⁶ Division of inherited land encourages building activity; it restricts the use of pastures and forests; it increases the livestock on the farms, and, thus, the production of manure. Even if there is a rigid size limit below which farms cannot be managed, it is far from being reached in Germany. The deterrent examples which are often given are mostly the result of other factors, as, for instance, the breakdown of industries where the small farmers were additionally employed.²⁷

Even if these economic reasons were justified, it seems that they were more than outweighed by the disadvantages. If the Government interferes with the liberty of parents to transfer their property at will, the Government's will becomes the only basic title of inheritance.²⁸ Inheritance, then, is a means of distributing goods by order of the State. It is "socialism in the interest of the owners. No wonder when those without property are induced then to strive for the power in the state in order to change this kind of socialism into one in the interest of those without property. They will draw the only logical conclusion which can be drawn from this type of legislation: they will demand the abolition of the right of inheritance."²⁹ Instead of distributing property among as many as possible, a class of disinherited is created. The objection which was raised against the establishment of entails in France a hundred years ago holds true even more in our times. England is the only country where a party of considerable strength demands the abandonment of private property in land; in France, with her enormous number of small owners, such a party is impossible.³⁰

As contrasted with the disinherited sons of the farmer, the heirs are supposed to form the new élite. The members of this élite are distinguished by the name *Bauer*, or peasant, which no other agriculturist is permitted to have. As always, such classifications and titles are a means of privilege and exclusion. They discriminate against those who do not belong to the privileged group. Is it more than an accident that the same classification once started the fateful development which led German farmers to the edge of the abyss? When Prussia freed her peasants from the relics of feudal serfdom in 1816, the decree of the Government distinguished between two classes of farmers: those whose holdings were too small to require a team of draught animals, and those who needed them. Only the latter were called "peasants" and were permitted to

²⁵ Max Sering, *Deutsche Agrarpolitik auf geschichtlicher und landeskundlicher Grundlage*, 55-56 (Leipzig, 1934).

²⁶ Aereboe, *Agrarpolitik*, 258 ff.

²⁷ *Ibid.*, 266-267.

²⁸ Lujo Brentano, *Erbrechtspolitik; Alte und neue Feudalität; Gesammelte Aufsätze*, 1:402 (Stuttgart, 1899).

²⁹ *Ibid.*

³⁰ *Ibid.*, 75.

keep their holdings, while the former became landless and shifting labor. When the new élite was formed in 1933 the principle of selection was neither achievement nor blood, but property. The requirement of racial purity excluded only a negligible group which was not prominent in farming, and it proved rather deceptive, for the members of a Slavonic race were held eligible to become owners of entailed farms.

Due to the inalienability of the land and the lack of adequate settlement, the élite is renewed by marriage only, and, in a negative sense, by the ejection of those members who do not live up to the commands of the authorities. But there is no intrusion of newcomers, no social progress, no "agricultural ladder"; there is, in short, no selection by achievement. The abandonment of this principle is characteristic of the crisis of civilization in Germany. It has been described and analyzed by an able sociologist: "In their competitive struggle for power, individual groups in our society promise, as a reward for their followers in the social conflict, to drop the principle of selection on the basis of achievement."³¹ The latter being thwarted, the members of the new village gentry are relieved from the struggle with new elements who could dispute the claims of this privileged aristocracy. They are relieved from this struggle as long as they appear to be faithful and loyal followers of the political power who gave them their privileges. Ultimately, the principle of selection is neither property, nor blood, nor achievement, but mere obedience which is rewarded by privileges.

The sponsors of the Entailed Farms Law expect that the families which form the new élite will become closely connected with the land. As a means to this end a high degree of immobility of tenure is attained. It is highly questionable whether such an inflexibility of tenure is desirable. While the mobility of American farmers is so tremendous that it would be desirable to make their tenure more fixed, too high a degree of immobility is already attained in the old countries, particularly in Germany. Mobility of farm population is, as the United States shows, not necessarily only geographical, but often social, as well. Thus an inflexibility of tenure often is a symptom of the lack of social progress among the farm population. The following summary indicates the changes in the possession of agricultural holdings in Prussia during 1920-1936.³²

Year	Number of holdings affected	Area in hectares	Percent of total area
1920	15,712	493,670	2.45
1925	11,683	295,096	1.46
1930	23,542	285,175	1.41
1931	23,508	228,572	1.13
1932	23,716	239,661	1.00
1933	17,441	221,696	0.92
1934	12,271	179,327	0.75
1935	13,907	178,689	0.74
1936	16,166	192,225	0.80

³¹ Karl Mannheim, "The Crisis of Culture in the Era of Mass-Democracies and Autarchies," *Sociological Review*, 26:114 (April 1934). See also Karl Brandt, "Junkers to the Fore Again," *Foreign Affairs*, 14:130-132 (October 1935).

³² *Statistisches Jahrbuch für das Deutsche Reich*, 1938, p. 431.

These figures show that the changes in the possession of agricultural holdings were extremely small even before the new legislation. The farms which were sold, rented, or otherwise alienated per year did not exceed 2 percent of the total area in all the years since 1920. In the United States, 34 percent of all tenants and 6 percent of all owners occupied their farms for less than one year in 1935. Even in Europe, an inflexibility like that of the German land tenure is extraordinary. In Denmark, for instance, the land sales per year amounted to 4.8 percent of all farms, or 4.4 percent of the farm land, before the depression.

Only about two thirds of the cases reported in the tabulation above are sales, as leases are also included. The figures do not include changes in possession which are brought about by inheritance. If one estimates the distance between two generations as thirty years, at least 3.3 percent of all holdings are concerned per year by a change in possession due to inheritance.³³

The inflexibility of the distribution of land ownership is also supported by the low inheritance taxes in Germany. While other taxes are extremely high, the death duties fall short of the rates prevailing in other countries. The smallest estates, however, carry a high tax rate which does not increase in Germany as progressively as in England and in the United States. Thus, there is no economic effect of the death duties in Germany, and the large estates are not broken up by this means which is so effective in England.

The inflexibility of the tenure as applied to the family deserves further analysis. The late Professor Karl Bücher once fervently contested the alleged strength of the farmer's family bonds. According to his opinion these ties are not stronger among the farm population than among other groups, and they are, in particular, not so strong as to require entailed farms legislation.³⁴ Bücher also laid stress on one other point. He asked if the moral value of the ties between the land and the farmer would not be far greater if the land had to be acquired by means of the farmer's efforts than if it had been inherited by one who, happily enough, was predetermined by his birth. "Nothing binds stronger than the sweat of labor."

As to the effects of entailed farms upon family life, there is plenty of material which shows that they are anything but good. Writers and novelists have often pictured the family conflicts arising out of the entailed farm. Undoubtedly, the fact that the *Anerbe* is not necessarily the best of his brothers, and that there are many chances that he is inferior to them, will cause many conflicts. The less happy and, perhaps, better fitted brothers will envy or even scorn him, especially if they become wage earners on the father's farm which is now under the command of the brother. Since there are many restrictions on the migration into the cities, the number of these men, which was already high, will increase. This is an atmosphere out of which, as Max Weber once put it, "the most dread-

³³ The percentage is not of the area as the Prussian census bureau assumes. Cf. "Der Besitzwechsel landwirtschaftlicher Grundstücke in Preussen," *Zeitschrift des Preussischen Statistischen Landesamts* (1934), 72:195.

³⁴ "Das bäuerliche Erbrecht," 333 ff.

ful passions" arise.³⁵ Moreover, many *Anerben* will lack respect in the treatment of their parents. Under farm inheritance laws of the past, farmers often took refuge in the most desperate devices in order to avoid the fate of being inherited while still alive. Herr Glatzel, president of the royal settlement court of Prussia, reported in 1894 that a part of the peasantry in Westphalia, where an entailed farms law was in force, had entered concubinages in order to avoid legitimate children to whom that law could have applied.³⁶

There is ample evidence relating to the large number of illegitimate births in the regions of closed inheritance.³⁷ If the ownership of land is concentrated, and if all but one son are disinherited, the desire to marry cannot express itself in as many legitimate marriages as when all sons are enabled to found homes. The following figures indicate the inverse correlation between the percent of illegitimate births and the percent of landowners in the rural regions of Bavaria for the years 1879-1880. These regions have been classified according to the number of illegitimate births per 100 births. The first figures show this percentage; the second figures indicate the number of landowners per 100 inhabitants: 3.4 to 5,—24.4; 5.1 to 10,—21; 10.1 to 15,—16.6; 15.1 to 20,—16.5; 20.1 to 25,—14.1; 25.1 to 30,—14.7.³⁸

Closed inheritance has the same effect as an outspoken restriction on the division of the holdings. In Germany, such a restriction is combined with the system of closed inheritance. There are countries and legislations, however, which contain only restrictions on the division of holdings, without providing for entailed farms. In Sweden, for instance, an inherited farm may not be divided among heirs if the division is impracticable. Saxony furnishes another example. There, a law of 1843 prohibited the separation of more than one-third of the area of a farm at the time of the enactment of the law. The measure which was once called "the frothing horse of the chariot of reaction" applied to about 70 to 75 percent of the total area.³⁹ The vicious consequences of these measures are illustrated by the following estimates for 1930 of the percentage of children procreated before or outside of marriage: Italy, 11; France, 13; Switzerland, 14; Sweden, 30; Saxony, 37.⁴⁰ Saxony and Sweden have a much higher number of illegitimate children and of *Brautkinder*, children who are procreated before marriage, than other countries. If the rural population has no chance to become independent, marriage is avoided and delayed as long as possible.

While the Nazis, according to many statements, do not recognize illegitimate children as inferior to legitimate children, they were not willing to accept another

³⁵ Max Weber, "Die ländliche Arbeitsverfassung," *Gesammelte Aufsätze zur Sozial- und Wirtschaftsgeschichte*, 446 (Tübingen, 1924).

³⁶ Quoted in Brentano, *Erbrechtspolitik*, 369.

³⁷ See the quotations, *ibid.*, 435, 442.

³⁸ Ludwig Fick, *Die bauerliche Erbfolge im rechtsrheinischen Bayern*, 314 (Stuttgart, 1895).

³⁹ Adolf Buchenberger, *Agrarwesen und Agrarpolitik*, 1:455 (Leipzig, 1892).

⁴⁰ Eidgenössisches Statistisches Amt, Berne.

consequence of the immobility of the land distribution, namely the rural exodus. Migration into the cities is being restricted, but it still continues, and every year brings a growing number of farm labor which has to be imported from foreign countries, especially from Eastern Europe and Italy, thus lowering the standard of living of domestic farm laborers.

Moreover, the German régime tries to raise the birth rate, while the entailed farm legislation keeps it down. The German census bureau itself has recognized that "in all occupations, married couples who own land have more children than those without land,"⁴¹ and that the land owners with only 5 to 50 hectares have the most children. "Already in the size group of 50 to 100 hectares the percentage of marriages with a higher number of children decreases, and there is a further and sharper decrease of this percentage among the owners of 100 and more hectares."⁴² The following figures show the relationship between the size of German farms held by married owners and the number of their children in 1933.⁴³

Size group in hectares	Marriages with children, percent of all marriages					
	0	1	2	3	4	5 or more children
2 to 5	11.0	14.7	18.0	15.0	11.4	29.9
5 to 20	9.4	15.2	19.1	15.5	11.5	29.3
20 to 50	10.4	14.7	19.1	15.3	11.2	29.3
50 to 100	11.0	14.3	20.9	16.4	11.0	26.4
100 and over	13.0	14.4	21.3	18.4	11.9	21.0

These observations afford an illustration of the many inconsistencies of centralized planning. Other aspects of the German population policy have been dealt with elsewhere.⁴⁴

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⁴¹ "Neue Beiträge zum deutschen Bevölkerungsproblem," *Wirtschaft und Statistik*, Sonderheft 15, p. 16-17 (Berlin, 1935).

⁴² *Ibid.*

⁴³ *Ibid.*

⁴⁴ For an excellent discussion, see Hans Staudinger, "Germany's Population Miracle," *Social Research*, 5:125-148 (May 1938).

BARBED WIRE FENCING—A PRAIRIE INVENTION

ITS RISE AND INFLUENCE IN THE WESTERN STATES

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The enclosing of land with some form of fencing material dates far back into history. Out of the desire for ownership, independence, and safety from intrusion, many different types of enclosures have been developed. The hedgerow, the stone wall, and the rail fence are expressions of these psychological and economic desires. Hence, when the early colonists—bearing with them the inheritances of the past—came to the New World, they began to build enclosures. The nature of these early fences was conditioned largely by the kinds of materials available. In New England, they were built largely of stones, while in the South, they were constructed of rails. These two types of fence construction predominated until the western movement reached the prairies where the supply of stone and timber was insufficient.¹

This situation resulted in experimentation with a number of other materials. Hedgerows were gradually developed, and a few homesteaders even resorted to mud and ditch enclosures. Timber was brought from neighboring States, but its cost was generally too great for those who lived on the frontier where the increased increment of their land was none too certain. As the line of settlement pushed farther west, the problem of fencing became even more acute. The small farmer found that the cost of fencing increased while the total income from his land diminished. The seriousness of the problem attracted the attention of the Federal Government, and in 1871, an elaborate report was issued by the Department of Agriculture. This report revealed that fencing, even in the most timbered areas, was very costly and that it was almost prohibitive to those who lived on the marginal lands of the western prairies.² As a result, the Great Plains were largely left unsettled until certain inventions became available.

In their attempts to find an economical fencing material many of the homesteaders turned to smooth wire which had been developed in the East during the early part of the nineteenth century.³ Although it was superior and generally cheaper than other materials, it did not meet all the exigencies of a prairie fence. The iron wire of that day was affected adversely by extreme temperatures; it snapped in cold weather and sagged in hot. Furthermore, it had no terror for the livestock of the open range; they loosened the posts and broke the

¹ W. B. Weedon, *Economic and Social History of New England*, 1:51-62 (1899); P. A. Bruce, *Economic History of Virginia in the Seventeenth Century*, 1:316-318 (1896). About 70 percent of Illinois was prairie, including swampland.—E. M. Poggi, *The Prairie Province of Illinois*, 70 (Urbana, Ill., 1934).

² U. S. Department of Agriculture, *Report*, 1871, p. 497-504.

³ *The Plough, the Loom, and the Anvil*, 2:177-179 (September 1849); Horace Capron, "Wire Fences," *Illinois State Agricultural Society, Transactions* (1856-57), 2:425-432.

wire by constantly rubbing against it. Finally, with the hope that animals could be satisfactorily confined within wire fences, men in the West turned to the problem of improving them.

Like many other agricultural inventions, smooth wire with some form of a barb on it has a long history. The early beginnings were in the Eastern States. The first crude patent was taken out by William D. Hunt of Scott County, New York, in 1867; he was followed in the same year by Lucien B. Smith of Ohio, and in the next year by Michael D. Kelly of New York.⁴ These three inventors laid the foundations for barbed-wire fencing by furnishing the basic patents, and, though none of their own manufactures ever proved very practical, they did serve to suggest certain improvements and new ideas that soon were to crystallize into a fence adaptable to the Western States.⁵

It was natural that practical barbed-wire fencing should have been first perfected and manufactured at DeKalb, Illinois. This city is located on the edge of the prairies, where the ongoing settlers pushed into the broad treeless expanses of the West, and where the real need for such fencing was first felt. Farmers and mechanics put their minds to this problem, and a check of the 394 patents listed by the American Steel and Wire Company in its three-volume set of *Early Barbed Wire Specimens* reveals that 176, or nearly half of the total, were issued to Illinois inventors.⁶

In the early 1870's, a number of men in the immediate vicinity of DeKalb began experimenting with this new type of fencing. Sociologically speaking, this community was conditioned for such a cultural innovation, and the environmental challenge had so emerged that a rather sizeable group responded. Two of them developed patents that produced a practical and durable fence at low cost. J. F. Glidden, on his farmstead near DeKalb, perfected a fence that eventually became the pattern for most of the barbed-wire producers and consumers, while Jacob Haish, a local lumber dealer, developed simultaneously the "S" barb that served as a close second for a short time.⁷ These patents were similar; both had two twisted wires, the main difference being in the way the barbs were attached. By 1874, Isaac L. Ellwood, a hardware merchant in DeKalb, saw the possibilities of the Glidden barb and purchased a half interest in the patent for a few hundred dollars, formed a partnership with the inventor, and began producing by hand a few thousand pounds per year.⁸ Haish entered

⁴ Washburn and Moen Manufacturing Company vs. Jacob Haish, "Complainants Record," 1-6, 66a (Chicago, 1880. DeF 225). All manuscript or archival references so cited are in the American Steel & Wire Company Museum at Worcester, Mass. All other similar references, unless otherwise noted, are in the Perry Ellwood collection at De Kalb, Ill.

⁵ Hunt sold his patent rights to Charles Kennedy of Hinckley, Ill., a small village about 20 miles from De Kalb.—143 *United States*, 154; *Iron Age*, 117:1769-1770, 1774 (June 24, 1926).

⁶ American Steel & Wire Co., *Early Barbed Wire Specimens*, 1-433 (Worcester, Mass., 1924-30). Of the 1,229 fence patents listed in the United States Patent Office by 1890, over one-half, or 696 were from Western States.—Washburn and Moen, *A Manual of the Fence*, No. 30 (Worcester, 1881).

⁷ *True Republican* (Sycamore, Ill.), July 31, Aug. 4, Sept. 27, 1875, May 27, 1876.

⁸ United States Patent Office, Sale and Assignment, Jan. 27, 1875 (No. 157124).

the business at the same time, and from these two small factories came the first successful production of barbed wire on a commercial scale.⁹

Following this introduction, patents on all shapes and forms of barbed wire appeared, and small factories sprang up in most of the adjacent villages. Since the wire was manufactured by hand and required little capital to start production, almost anyone could enter the business.¹⁰ Blacksmiths, carpenters, and mechanics rushed to share the profits, each making his own particular barb. By 1884, local publications referred to at least 13 different concerns in the immediate vicinity of DeKalb, while Joliet and Chicago each had 8 factories running in 1883, and St. Louis had 11 in 1886. A few concerns operated in Iowa and Kansas, and others sprang up in the East, but the real center of the industry during its early years lay in northern Illinois.¹¹

The production of these small mills increased rapidly from year to year as automatic machinery was perfected and people became accustomed to this new type of fencing.¹² It is impossible to give accurate figures on the total production of barbed wire in the United States during these years, since records were poorly kept at that time. Moreover, several of the concerns were "moonshiners" and purposely concealed their output. A few publications, such as the *Iron Age* and the *Chicago Industrial World* placed the average annual tonnage for 1880-1884 at somewhere between 80,000 and 100,000 tons, or between 400,000 and 600,000 miles of single-strand wire. By 1888, it was estimated by Charles G. Washburn at about 150,000 tons and in 1895, somewhere in the neighborhood of 157,000 tons.¹³

⁹ In 1876, there were 2 concerns at Joliet, 1 at Aurora, 1 at Chicago, and 1 at Bridgeport, Conn. 159 *United States*, 423.

¹⁰ In 1877, the equipment of the St. Louis Barb Fence Company was valued at \$1,500.—"Bill of Sale," Aug. 11, 1877 (DeD 780). Of the five companies at St. Louis in 1886, the largest capital investment was \$7,000 and the lowest was \$2,000.—American Steel & Wire Co., *Industrial Museum Photos*, 3:186 (Worcester, c. 1932).

¹¹ *True Republican*, Dec. 5, 1874, July 24, Sept. 25, 1875, Jan. 19, 1876, Mar. 23, 1878, Jan. 29, 1879, Nov. 29, 1882, Oct. 6, 1883, May 1, 24, 1884; *Iron, Hardware and Implement Trade*, Apr. 19, 1877; *Iron Age*, 27(2):20 (Jan. 13, 1881), 34(12):24 (Mar. 27, 1884), 36(22):24 (Nov. 26, 1885), 37(7):22, (8):22, ff., 38(13):20 (Feb. 18, 25, Sept. 23, 1886); *Industrial World and Iron Worker*, Feb. 12, Oct. 14, 1880, Feb. 10, 1881, Oct. 5, 1882; *Age of Steel*, 56(24):10 (Dec. 13, 1884). I. L. Ellwood stated in 1883 that "There are now some forty manufacturers licensed under our patents."—*Glidden Barb Fence Journal*, 4:5(1883). Washburn and Moen purchased Glidden's half interest in 1876 and began production at Worcester, Mass. They took the southern and southwestern States as their territory and Ellwood retained the western States.—"Digest of Agreements," 23-24 (DeA 107). The consolidation of the industry under a few basic patents was largely effected by these two concerns and J. W. Gates of St. Louis.

¹² The principal barbing machines were patented by S. M. Stevens of De Kalb, D. C. Stover of Freeport, Ill., and H. W. Putman of Bennington, Vt.—*St. Louis Journal of Commerce*, Dec. 27, 1879; *Industrial World and Iron Worker*, Sept. 28, 1882; H. W. Putman to C. F. Washburn, Bennington, Vt., Aug. 28, 1875 (DeC 527).

¹³ *Industrial World and Iron Worker*, Feb. 12, 1880; *Iron Age*, 31(15):11 (Apr. 12, 1883), 34(23):10 (Dec. 4, 1884), 57:272 (Jan. 23, 1896); *True Republican*, Oct. 17, 1883; C. G. Washburn, *Industrial Worcester*, 157 (Worcester, 1917). According to the Haish Papers and Account Books in the possession of W. J. Budrow of De Kalb, Jacob Haish's tonnage in-

During the early years much of the barbed wire was of inferior grade since the smooth wire from which it was made was often brittle and uneven in quality, due to hard and soft spots. Over half of the production was painted instead of galvanized, and as it was dipped after the barbing operation, it often rusted and broke.¹⁴ This matter was adjusted somewhat with the introduction of the Bessemer process. Many different styles of barbs were put on the market, ranging all the way from the "spur-wheel" to the "chain-link."¹⁵ Not infrequently farmers purchased the smooth wire separately and applied the barbs with special instruments after the wire had been placed on the posts.¹⁶

Most of the tonnage produced in the western mills was sold in the Prairie States where the farmers first discovered the merits of this type of fencing.¹⁷ A number of the manufacturers sold to jobbers who in turn sold to local merchants. However, the larger and stronger concerns had general agents with exclusive rights in certain States. Perhaps the most famous of these was the partnership of Sanborn and Warner, who were contracted by the makers of the Glidden barb for the entire United States and later for Texas.¹⁸ These men made their headquarters at Houston and whole trainloads of barbed wire were shipped from their warehouse. In 1885, an editor took a "peep into the immense warehouse" at Houston and "left fully impressed with the idea that they had taken a contract to fence in the entire State."¹⁹ Advertisements in Texas newspapers stated that their sales were "five times greater than those of all others combined" and that it was sold "in nearly every town in the State."²⁰

These men found plenty of competition in selling their product. There were a large number of manufacturers, and "moonshine" wire was, as one salesman

creased from approximately 1,540 tons in 1879 to 6,234 in 1884. The Glidden barb increased from 60 tons in 1876 to 44,000 in 1886.—See Washburn and Moen vs. Beat 'Em All Wire Co., "Complainants Record," 542-546 (Chicago, 1887. DeF 227).

¹⁴ Jacob Haish Papers and Account Books; *Iron Age*, 30(9):24 (Feb. 26, 1885).

¹⁵ American Steel & Wire Co., *Early Barbed Wire Specimens*, books 1-111 (Worcester, 1924-1930).

¹⁶ *True Republican*, Dec. 5, 1874; P. H. Pooler to Charles N. Pritchard, Serena, Ill., Sept. 24, 1914.

¹⁷ *De Kalb Chronicle* (Ill.) Apr. 1, 8, 1879; A. Morrison and J. H. C. Irwin, *The Industries of Saint Louis* . . . , 69 (St. Louis, 1885); *Industrial World and Iron Worker*, Aug. 3, 1882. According to the Haish Papers and Account Books, Haish's best States ranked: Iowa, Illinois, Texas, Wisconsin, and Nebraska. Washburn and Moen sold nearly two-thirds of their output in the Southwest through their Chicago warehouse. "Sales Record," (DeC 847); Washburn and Moen vs. Jacob Haish, "Complainants Record" (1879), 66b (DeF 225). Wire fences in Kansas increased from \$3,579,997 to \$6,448,236 during 1881-82.—Kansas State Board of Agriculture, *Biennial Report* (1881-82), 3:567.

¹⁸ J. F. Glidden to H. B. Sanborn, *De Kalb*, Nov. 24, 1874 (DeC 759).

¹⁹ *Burke's Texas Almanac and Immigrants Handbook*, 160 (Houston, 1885). See R. D. Holt, "Barbed Wire," *Texas Monthly*, 4:174-185 (September 1929).

²⁰ *Texas Siftings* (Austin), Jan. 27, 1883, p. 3; *Huntsville Item* (Tex.), June 29, 1882. During the year 1882-83, \$1,330,000 worth of barbed wire was sold from the Houston warehouse.—*Galveston Daily News*, Sept. 1, 1883, [p. 8].

put it, "as free as water." The infringement of patents was a common practice, for many of the concerns found it necessary to pattern their fencing after a few of the better patents in order to get a share of the business. This made it difficult for certain well-established firms, who were licensed and had regular agents, to sell their wire. Not having to pay royalty fees, the unlicensed manufacturer and dealer had considerable advantage.²¹ Those who purchased the wire were likewise under constant surveillance by detectives, and competing dealers who threatened them with suits, for, under the patent laws, the innocent user was just as liable as the vendor. This situation caused many consumers to look with suspicion on barbed-wire merchants.²² The companies, in order to overcome this apprehension, promised to "defend any and all suits brought against their customers," but this did not allay the fears, and in a few places the tension became so great that the farmers banded themselves together into protective societies.²³

Other types of fencing materials also occasioned some competition, especially in communities where lumber was plentiful. In 1875, Ellwood notified his Minnesota agent that he did "not expect the wire to be much in demand where farmers can build bush and pole fences out of the growth on their own land and think[s] the time spent in canvassing such territory very nearly lost even if some sales are made."²⁴ Even as late as 1885, rails and stone were competitors of barbed wire in certain counties of Texas and Montana. The cattlemen and the small property owners were by no means in full agreement on the wisdom of fencing the range country.²⁵ They knew from sad experiences what a barbed-wire fence could do to herds during storms, and the Colorado Cattle Growers Association went on record in 1884 as being averse to fencing the range.²⁶ Barbed wire was denounced by many as cruel, and, to crystallize this sentiment, anti-barbed-wire groups were formed to combat its use and to bring pressure on legislators to enact laws making those who built wire fences responsible for dam-

²¹ I. L. Ellwood to C. F. Washburn, De Kalb, July 21, 1881; *National Live-Stock Journal*, 10:192 (April 1879); *Western Rural*, 23:88 (Feb. 7, 1885).

²² A western farmer reported that he had "three or four applicants swarming around him" representing the drive well and barbed wire patents.—*National Live-Stock Journal*, 3:435 (July 12, 1887); *Iowa State Register* (Des Moines), Mar. 19, 26, 1879.

²³ *Iowa State Register*, Jan. 12, 13, Mar. 9, 1881; *Daily Gate City* (Keokuk, Ia.), Mar. 15, 1881.

²⁴ Barb Fence Company to Sanborn, De Kalb, Oct. 22, 1875. The lumber interests were vigorously opposed. *The Northwestern Lumberman* denounced barbed wire as a most undesirable fence and encouraged farmers to build wood and hedge enclosures. *Industrial World and Iron Worker*, Apr. 7, Aug. 4, 1881.

²⁵ *Burke's Texas Almanac*, 143; *Democratic Leader* (Cheyenne, Wyo.), Mar. 6, 27, 1884; E. S. Osgood, "The Cattleman in the Agricultural History of the Northwest," *Agricultural History*, 3:122 (July 1929). Kansas had seven times more hedge than wire fence in 1878.—Kansas State Board of Agriculture, *Biennial Report* (1877-78), 1:526-527.

²⁶ *Colorado Live-Stock Record*, quoted in *Breeder's Gazette*, 6:157, 456 (July 31, Sept. 25, 1884); *Prose and Poetry of the Live-Stock Industry of the United States*, 1:684-685 (Kansas City, 1904-05).

ages.²⁷ In some States many years elapsed before this type of fencing was legal; in others, the courts, even after it was legalized, held the owners responsible for all damages "unless constructed with planks in connection with the wire."²⁸

In spite of competition and opposition, the sales of barbed wire increased steadily. Agricultural journals and newspapers, cognizant of their circulation and advertising, were generally in favor of this type of fencing, for they were well aware that it was less expensive and more effective, and that it facilitated western settlement.²⁹ The manufacturers aided their own cause by developing "more merciful barbs and shorter prongs"; the farmers alleviated much of the injury to stock by placing boards on the wire so as to give it greater visibility; and the livestock became adjusted to it. Soon several of the States had regulations requiring farmers to fence if they expected to recover damages from roving stock.³⁰ Farms were becoming smaller in size as the population increased, and this in turn increased the demand for wire; for, as the size of the enclosure decreased, the number of rods of fence per acre increased.³¹

The railways were also large consumers of barbed wire, as most of the States required them to fence their right-of-ways if they expected to escape responsibility for damages.³² The fact that there were 93,671 miles of railroad trackage in 1881, all needing a 3- or 4-wire fence on both sides of the track, indicates their potentialities as customers.³³ Railroad companies in the Middle West began

²⁷ *National Live-Stock Journal*, 12:425 (October 1881); *Iowa State Register*, Apr. 6, 1881; *Industrial World and Iron Worker*, 25(2):5 (July 23, 1885). Illinois "legalized the use of Barbed Wire fences in 1887."—*Iron Age*, 39(18):32 (May 5, 1887). Vermont, Connecticut, and New Hampshire attempted to enact anti-barbed wire laws.—*Vermont Watchman and State Journal* (Montpelier), Nov. 25, 1880; *Hartford Daily Courant*, Feb. 27, 1880, [p. 2]; Washburn and Moen, "A Statement to the Legislature of New Hampshire on Barb Wire Fencing," (Manchester, 1881, DeC 805).

²⁸ H. P. N. Gammel, comp., "General Laws . . . Passed at the Regular Session of the Sixteenth Legislature (1879)," *The Laws of Texas*, 8:67 (Austin, 1898); *Daily Gate City*, Dec. 12, 1884.

²⁹ 48 Congress, 2 Session, *House Executive Document 267*, p. 78 (serial 2304); *Rocky Mountain Husbandman*, Apr. 29, 1880.

³⁰ *Texas Live Stock Journal*, 8(1):14 (Aug. 6, 1887); *Iron Age*, 40(24):30 (Dec. 15, 1887); R. H. Tyler, *A Treatise on the Law of Boundaries and Fences*, 448-486 (Albany, 1876); Washburn and Moen Mfg. Co., *Fence Laws*, 3-4 (Worcester, 1880). Texas aided the sales of barbed wire by requiring each farmer to fence the land leased "in order to appropriate it to his own exclusive use."—Texas General Land Office, *Reports* (1886-88), 6.

³¹ "A square 10-acre field requires 16 rods of fence per acre, while a square field of only 1 acre requires approximately 50 rods."—H. N. Humphrey, "Cost of Fencing Farms in the North Central States," U. S. Department of Agriculture, *Bulletin 321*, p. 12-13 (Washington, Government Printing Office, 1916).

³² W. W. Thornton, *The Law of Railroad Fences and Private Crossings*, 194-200 (Indianapolis, 1892); Washburn and Moen, *The Laws of Railway Fencing*, 1-16 (Worcester, 1881). Texas and Pacific Railway Company, *Annual Report*, (1889), p. 13-14. Damages ran high with some of the western companies. In 1889 the Texas and Pacific expended \$123,423.46 for damages to livestock.—*Ibid.* (1890), p. 29-33. Cf. *Democratic Leader*, Feb. 21, 26, 1884; *Daily Optic* (Las Vegas, N. Mex.), Dec. 27, 1880; *Bad Lands Cow Boy* (Dak. Terr.), Nov. 25, 1886.

³³ The Illinois Central built fences with five wires.—*Cultivator and Country Gentleman*, 46:357 (June 2, 1881).

rather early to utilize this type of fencing. Ellwood reported in 1879 that he was furnishing 59 roads with the Glidden barb, and by 1885, the number had increased to "over one hundred."³⁴ The Western Fence Company of Chicago, a concern devoted entirely to railroad-fence construction, set up thousands of miles of wire fence, employing from four to five hundred men with their own equipment of sleeping and dining cars.³⁵

The sales of barbed wire were further stimulated by the gradual decrease in prices. When the manufacture of this fencing material first began in 1874, the prices ran as high as 20 cents per pound; the following year they dropped to 18 cents; and during the succeeding years continued to fall until, by 1893, some concerns quoted for as low as 2 cents.³⁶

Meanwhile, in the Western States where most of the barbed wire was being used, changes were taking place as a result of its influences. In describing these changes it should be noted at the outset that barbed wire was not the only factor involved. Barbed-wire fencing encouraged the further settlement and exploitation of the Great Plains. For a time during the early seventies, settlement of this region was slowed down considerably, partly because of the high cost of fencing materials. If the homesteader wished to safeguard his crops, he had to have fences, and yet their cost was prohibitive.³⁷ Barbed wire helped to solve this problem at a cost within the range of the small farmer. On the level prairies, a settler could enclose a field with a 3-wire fence at an average cost of about \$150 per mile, while with board, stone, or rail, he could not approach that figure.³⁸ Board and picket fences often ran as high as \$300 per mile.³⁹ With wire-fencing materials selling at the above prices, homesteaders

³⁴ *Glidden Barb Fence Journal*, 6:13(1885). Both the Ellwood and the Washburn and Moen concerns had agreements with the Western Railway Association to furnish all their wire.—"Digest of Agreements," Mar. 22, 1881 (DeC 824).

³⁵ *True Republican*, May 5, 1883; *Age of Steel*, 50:37 (July 9, 1881); *Chicago Journal of Commerce*, June 2, 1880.

³⁶ I. L. Ellwood & Co., "Price Lists," spring, 1875 (DeC 765); Continental Wire Co., "Price Lists," June 1893 (DeC 805). Testimony of J. W. Gates before the Committee on Investigation of the United States Steel Corporation, May 27, 1911, in United States Steel Corporation, *Hearings*, 1:25 (Washington, 1911). For a complete list of prices for 1882-1912, see H. E. Horton, "Barbed Wire Prices" (MS., John Crerar Library, Chicago, 1913).

³⁷ Charles Anderson to Grover Cleveland, Arlington Springs, Colo., Nov. 14, 1887 (No. 10,752). Letters with these numbers are in the General Land Office, Washington, D. C. Cf. U. S. Department of Agriculture, *Report*, 1871, p. 497-504; Fred. Sommerschue, "What Shall We do for Fences?" Iowa State Agricultural Society, *Annual Report* (1860), 7:110-119; Kansas State Board of Agriculture, *Biennial Report* (1877-8), 1:110, 114, 130, 199.

³⁸ W. T. Carpenter to I. L. Ellwood, Clarendon, Texas, Nov. 15, 1889; *Glidden Barb Fence Journal*, 6:11 (1885). The *New Mexico Stock-Grower* reported costs between \$100 and \$140 "to put up good substantial wire fence."—*Breeder's Gazette*, 6:572 (Oct. 16, 1884). The *St. Paul Farmer* (Minn.) in 1884 showed that the "Actual saving to the farmers of the country by the barbed wire invention . . . was \$55,192,240; and that if all the fences in the country were made of it, the saving would have been \$809,597,714."—*National Live-Stock Journal*, 3:404 (June 28, 1887).

³⁹ *Industrial World and Iron Worker*, June 10, 1880; *Glidden Barb Fence Journal*, 6:11 (1885); W. P. Webb, *The Great Plains*, 283 (Boston, 1931).

flowed into the Great Plains.⁴⁰ Around their small farms they built enclosures, and as a result the neighboring stockmen were gradually pushed back where grass was still free and settlers scarce.⁴¹ In 1883, the cattlemen of Texas were forced into the dry, free range of the Panhandle. In the following year the small agriculturists of New Mexico were bringing pressure on what one observer called "the grandest interest of the country,"⁴² and the *Cheyenne Live Stock Journal* reported that the thirty eastern counties of Nebraska were under fence and that the stockmen had to move westward for free range.⁴³ By 1885, many of the cattlemen in Montana were grazing their stock on the "high altitudes," and by 1886, word came from Dodge City that the "large stock ranges of Kansas have all been settled up by the hardy sons of toil, and the ranchman was obliged to move Westward to some other country which was yet unsought for by the immigrant of the East."⁴⁴ Finally, in 1887, from the last remaining range country, came word from the Territorial Governor of Washington that "the plow is turning down the bunch grass and the fence is driving out the stockmen."⁴⁵

In desperation and as a final resort, the cattlemen built barbed-wire fences to hold the land that remained. Miles upon miles of "bristling barbs" were strung across the short-grass prairies to keep the nesters out. With this cheap material, fences were thrown up promiscuously, and the public domain was illegally fenced, enclosing the water holes and securing great pastures by fraudulent entries. A disappointed home-seeker from Brent County, Colorado, described this situation when he wrote his Government that "the honest tiller of the Soil and Small Stockman are entirely debarred from the use of their lands belonging to the Government—many of their lands would be taken up by Homesteaders if they were open for Settlement."⁴⁶ Barbed wire not only aided the small farmer to gain a foothold in the Great Plains; it enabled the cattleman as well to secure and hold range land for his herds.

The barbed-wire fence made better farming possible. An Iowa agricultural

⁴⁰ During the 1870's, the number of farms in the eleven western States increased nearly 74 percent. U. S. Census, 1880, *Productions of Agriculture*, ix.

⁴¹ *Galveston Daily News*, May 11, 1882 [p. 3], *Democratic Leader*, Nov. 29, 1888; River Press (Fort Benton, Mont. Terr.), Dec. 18, 1884; *Texas Panhandle* (Mobeetie), Feb. 25, 1882; *Montana Stock Growers Journal*, 5:22 (Mar. 2, 1889).

⁴² *Galveston Daily News*, Sept. 1, 1883; *Prose and Poetry of the Livestock Industry*, 1:684-685; *Gringo and Greaser* (Manzano, N. Mex.), Feb. 15, 1884.

⁴³ *Breeder's Gazette*, 6:904-905 (Dec. 18, 1884); Nebraska State Board of Agriculture, *Transactions*, 1879-80, p. 77.

⁴⁴ *Breeder's Gazette*, 10:455 (Sept. 23, 1886). In 1883 the border between the stockmen and grain raisers was Barber County, Kans.—Reginald Aldridge, *Life on a Ranch*, 28-29 (New York, 1884).

⁴⁵ 50 Congress, 1 Session, *House Executive Document 1*, pt. 5, p. 941 (serial 2541); *Rocky Mountain Husbandman*, Jan. 29, 1885.

⁴⁶ I. H. Miller to H. M. Teller, La Junta, Colo., Nov. 16, 1883 (No. 108,683). See also P. W. Hey to H. M. Teller, Farnsworth, Kans., Nov. 26, 1883 (No. 11,469); and 48 Congress, 1 Session, *Senate Executive Document 127*, p. 1-45 (serial 2167). Some pastures required as much as 200 miles of wire.—*Huntsville Item*, June 29, 1882; *Breeder's Gazette*, 4:73 (July 19, 1883).

editor, commenting on this matter, stated that the wire fence enabled the farmer to "cut his farm into desired lots and fields at a small expense of time and means and thus observe more generally and fully the laws which govern the excellence of the crop secured by a wise rotation."⁴⁷ Fences not only protected the growing crops from livestock, but also gave the farmer an opportunity to use the fields as pasture after harvest. In the western country, fences also compelled travelers to follow the roads rather than cross fields, which was long a common practice on the frontier. The wire fence did not occupy as much space, nor did it shade the crops or harbor weeds, insects, and small animals like the other fencing materials.⁴⁸

Along with improved farming came an improved grade of livestock. Fences confined the animals to restricted areas, and they no longer had to rustle far and wide for feed and water. As a result, hay and inside ranges were used during the winter months, and by 1889, many of the western stockmen were feeding corn and alfalfa hay.⁴⁹ Thus, a higher grade of beef cattle was produced. The president of the American cattle trust summed up this matter very nicely when he remarked: "A hay stack is better than a snow drift. A pasture with a moderate herd of well-bred cattle, with feed and shelter for winter, is worth more than a myriad of half-starved brutes roaming over the plains."⁵⁰

When farmers and stockmen resorted to enclosures, the animals increased in number and weight as well as value—a result comparable to the increase of farm crops which followed the introduction of the grain binder.⁵¹ Bulls were enclosed in pastures and no longer allowed to roam over the prairies at will, mixing with inferior cattle.⁵² This more careful attention to breeding increased the number of cattle, for it materially cut down the death rate of bulls. An observer in 1886 found that when bulls were allowed to roam the range the losses of them often ran as high as five times as great as cattle.⁵³ The same was true with calves. In the early eighties, Joseph Nimmo found that they "dropped at all seasons of the year," but with pastures and shelters, this came to an end, and a larger percentage were raised to maturity.⁵⁴

⁴⁷ *Iowa State Register*, May 22, 1881.

⁴⁸ *Breeder's Gazette*, 2:295 (Aug. 31, 1882); *Industrial World and Iron Worker*, June 10, 1880; *Glidden Barb Fence Journal*, 4:9 (1883).

⁴⁹ *Montana Stock Growers Journal* (Feb. 23, 1889); *Mills Investors Guide* (N. Mex.), Jan. 1, 1888.

⁵⁰ *Texas Live Stock Journal*, 8(49):5 (July 7, 1888).

⁵¹ *Bad Lands Cow Boy*, Nov. 27, Dec. 18, 1884. A report of the United States Bureau of Animal Industry gives the increase as about 30 percent for the States west of the Mississippi during 1880-84. For Iowa the number nearly trebled.—John A. Hopkins, Jr., *Economic History of the Production of Beef Cattle in Iowa*, 77 (Iowa City, 1928).

⁵² *Breeder's Gazette*, 5:551 (Apr. 10, 1884). Pierre Wibaux developed a "bull ranch" on the Little Missouri for the stockmen of that vicinity. The bulls were kept under fence and fed for \$2 per month.—*Bad Lands Cow Boy*, Nov. 27, 1884.

⁵³ United States Bureau of Animal Industry, *Annual Report* (1886), 3:193.

⁵⁴ 48 Congress, 2 Session, *House Executive Document 267*, p. 11 (serial 2304). Enclosures also aided greatly in reducing the losses of animals from locoweed. Those "kept in in-

The practice of weaning calves in the fall of the year was also given encouragement with the coming of the barbed-wire fences. One editor wrote in 1884 that the cattle "owners should secure lands and enclose pastures in which to wean calves. They will find that by so doing their cattle will grow larger, and it is large steers that make the best beeves and bring the top prices in the market. We therefore suggest the advisability of keeping the range bulls in pastures at certain seasons of the year, and the same pastures would answer for weaning calves."⁵⁵

Barbed-wire fences were instrumental in helping to break up the cattle drives from the southern to the northern ranges, and this in turn brought about radical changes in the methods of fattening and transporting livestock. For years the cattlemen had driven their stock over the long trails to railroad stations or northern ranges, but with the influx of homesteaders who fenced the trails and water holes, the drives were forced farther to the west and ultimately had to be abandoned altogether in favor of the railroads.⁵⁶ By diverting or stopping this practice the farmers no longer had to suffer the crime and disorder as well as destruction of crops that accompanied a great drive.⁵⁷ Moreover, by closing these trails much of the stock disease that tormented the western farmers for nearly a decade was greatly reduced, and the lawsuits, killings, and quarantines which often accompanied a herd of infected cattle were reduced to a minimum.⁵⁸ The abandoning of the drive also made for better beeves as well as better prices. Instead of marketing cattle by "a long, weary drive" they could, with pastures, be held off the market and fattened and only part of the herd shipped at a time.⁵⁹

Enclosures did much to reduce the number of strays and stolen animals, for on the unfenced ranges horses and cattle wandered away from their owners by the thousands. In 1887, the Wyoming Stock Growers Association reported that "4,000 estrays had been recovered."⁶⁰ The number not recovered was

closures, where the plant grows in limited quantities" were unable "to get enough at any one time to bring on the more severe symptoms."—Bureau of Animal Industry, *Annual Report* (1886), 3:273.

⁵⁵ The editor of the *Rocky Mountain Husbandman*, in the *Bad Lands Cow Boy*, Nov. 27, 1884. Cf. Nebraska State Board of Agriculture, *Transactions*, 1879-80, p. 77, 82.

⁵⁶ *Democratic Leader*, July 3, 1884; *Galveston Daily News*, Sept. 1, 6, 1883, [p. 3]; T. J. Cauley, "Early Business Methods in the Texas Cattle Industry," *Journal of Economic and Business History*, 4:480 (May 1932).

⁵⁷ 48 Congress, 1 Session, *Senate Executive Document 127*, p. 7 (serial 2167); Louis Pelzer, "The Shifting Cow Towns of Kansas," Illinois State Historical Society, *Transactions*, 33:49 (Danville, Ill., 1926). The *Idaho Statesman* reported during the drive, cattle "crowd the ferries and crossings, get mixed with the cattle on the range, requiring much labor and care on the part of resident stockmen to prevent their cattle from being driven off."—*Chicago Journal of Commerce*, June 11, 1879.

⁵⁸ W. T. Carpenter to I. L. Ellwood, Spade Ranch, Texas, Oct. 1, 1889.

⁵⁹ *Galveston Daily News*, Sept. 1, 1883, [p. 3]; *Breeder's Gazette*, 11:4 (Jan. 6, 1887).

⁶⁰ *Breeder's Gazette*, 11:618 (Apr. 21, 1887). Cf. *Junction City Union* (Kans.), Sept. 25, 1880, [p. 1].

unknown. Mavericks, too, were a source of expense and trouble for the cattlemen, and it was not until their herds were brought under fence that the losses were reduced.⁶¹ With wire fences, stock stealing became more difficult. The expense of combating this curse had been high, since the range men were compelled to hire detectives, and in some places it had reached such proportions that the cattlemen mobilized themselves into protective associations "to look out for, and catch if possible, horse or cattle thieves."⁶² The losses from stampedes were also greatly reduced, for stock under fence was less wild and more easily handled; the shutting off of swamps, marshes, and boggy spots by wire fences also helped to cut down the death toll.⁶³ Before the era of the wire fence, a large number of horses followed the wild mustangs and were lost. On a single unfenced farm near Cheyenne nearly two hundred mares wandered away.⁶⁴ Wild horses were numerous in most of the Western States, and few of the ranchmen escaped the loss of some of their horses. *The New Mexico Stock-Grower* reported in 1884 that almost "every ranchman in the Territory seems to be hunting for lost horses."⁶⁵

The time-worn custom of branding and counter branding was a perplexing problem for the westerner. The number of brands had increased so rapidly that it became difficult to originate a new one. Thomas Sturgis, one of the great cattle kings, in a speech before a stockmen's convention at Denver in 1886 called attention to the multiplicity of brands, and the *Elbert Tribune* reported that there were at the time over nine thousand in Colorado alone with many variations "running all the way from a plain saw-horse to a lop-sided water jug."⁶⁶ Besides the complexities of the system, branding had certain definite limitations that were becoming noticeable.⁶⁷ The Tanners Association of America at its convention in 1886 devoted a whole series of discussions to the effect of branding on the value of hides, and it was estimated at that time that it caused a loss of \$15,000,000 a year to the stockmen of the plains. The *Laramie Boomerang* estimated that a cow branded on the side was worth \$2 less; while the *Colorado Live-Stock Record* went so far as to say that a branding-iron

⁶¹ In 1885 the Wyoming Stock Growers Association sold \$26,074.15 worth of mavericks.—*Democratic Leader*, Apr. 9, 1885.

⁶² *Rocky Mountain Husbandman*, May 17, 1883. See also *Weekly Miner* (Mont. Terr.), Nov. 8, 1881; J. F. Dobie, "Detectives of the Cattle Range," *Country Gentleman*, 92(2):30-31 (February 1927). The cost for detectives in Wyoming was \$15,202.91 for one year.—*Democratic Leader*, Apr. 7, 1887. Stockmen's associations generally gave \$250 reward for the arrest and conviction of any person found guilty of theft of stock.—*Galveston Daily News*, Apr. 28, 1882, [p. 4]; *Texas Panhandle*, Feb. 25, 1882.

⁶³ *Galveston Daily News*, Feb. 21, 1882, [p. 3], Sept. 1, 1883, [p. 3]; *Democratic Leader*, Apr. 3, 1884.

⁶⁴ *Democratic Leader*, Nov. 27, 1884.

⁶⁵ *Breeder's Gazette*, 6:572 (Oct. 16, 1884); *Junction City Union* (Kans.), June 12, 1880 [p. 4].

⁶⁶ *Breeder's Gazette*, 10:310 (Sept. 2, 1886); *National Live-Stock Journal* (weekly ed.), 2:72 (Feb. 2, 1886); *Bad Lands Cow Boy*, Dec. 18, 1884.

⁶⁷ U. S. Bureau of Animal Industry, *Annual Report* (1886), 3:190-191.

mark would lessen the value of a good horse by \$50.⁶⁸ With the introduction of enclosed pastures, branding became less common, since stock no longer were allowed to roam and mix with other livestock of the range.

The constant fear of Indian raids on the cattle herds was also somewhat lessened when fencing came into vogue on the plains. When cattle were moved over the trails, the Indians often swooped down upon the herders and tenders, killing and stealing.⁶⁹ The situation became so desperate in some parts of the country that stockmen equipped their trail men with sufficient guns and ammunition to repulse any marauding party. For example, the drive from Oregon into the Yellowstone country in 1880 found the drivers supplied with 120 men, 160 "stand of loaded rifles. . . good for about 3,000 shots at any band of hostile Indians that may attack them."⁷⁰

This new fencing material was not always beneficial to stockmen. Animals were killed in rather sizeable numbers by lightning that struck the fence wires; many died of the "screw worm" as an aftermath of wire injuries; and the death rate from drifting during blizzards was always high. In the heavy snow storms barbed wire prevented the cattle from moving about freely, and as a consequence they huddled together along the fence lines and "shivered to death."⁷¹ Prairie fires that so often swept over the grass lands of the West occasionally left the livestock to perish from starvation as the fences held them within the burnt pastures.⁷² Fencing was also a factor in depleting much of the valuable timber on the western plains. The cattlemen and small farmers alike cut down acre after acre of logs to be used for fences, landing chutes, and buildings.⁷³ It also caused some curtailment of the hide and bone industries that had flourished on the western ranges, for the animals no longer perished in such great numbers.⁷⁴

Barbed wire also brought about some interesting social changes. The fencing of the land enabled the farmers and stockmen to reduce their costs of employment, as they were able to reduce the number of herders, line-riders, and cowhands in general.⁷⁵ This was no small item with the westerner, for under the

⁶⁸ *Bad Lands Cow Boy*, Dec. 18, 1884, Nov. 25, 1886; *Breeder's Gazette*, 6:608 (Oct. 23, 1884). It was estimated that branding caused a loss of \$2,000,000 in Chicago alone.—*Western Rural*, 23:732 (Nov. 14, 1885).

⁶⁹ 48 Congress, 2 Session, *House Executive Document 267*, p. 50 (serial 2304); H. T. Burton, "A History of the J A Ranch," *Southwestern Historical Quarterly*, 31:355 (April 1928); C. M. Love, "History of the Cattle Industry in the Southwest," *ibid.*, 19:388 (April 1916); *Democratic Leader*, Nov. 3, 1885.

⁷⁰ *National Live-Stock Journal*, 11:203 (May 1880).

⁷¹ *Ibid.* (weekly ed.), 2:102 (Feb. 16, 1886); *Democratic Leader*, Feb. 28, 1884.

⁷² U. S. Bureau of Animal Industry, *Annual Report* (1886), 3:185.

⁷³ 48 Congress, 1 Session, *Senate Executive Document 127*, p. 25 (serial 2167); Love, "History of the Cattle Industry in the Southwest," *Southwestern Historical Quarterly*, 20:9 (July 1916).

⁷⁴ Mitchell County, Texas, alone shipped 108 carloads of bones in 1882.—*Galveston Daily News*, Jan. 7, 1882, [p. 4].

⁷⁵ 48 Congress, 1 Session, *Senate Executive Document 54*, p. 128 (serial 2165); F. L. Paxson, "The Cow Country," *American Historical Review*, 22:65-82 (October 1916).

local herd laws of many of the counties the farmers as well as the stockmen were compelled to look after their own livestock.⁷⁶ Roundups, too, were expensive, and the fenced pastures aided the owner in eliminating the necessity of sending cowboys to all the adjacent roundups to identify his cattle.⁷⁷ Moreover, the reduction in the number of cowhands had a decided influence on the moral and ethical standards of the community. For years lawless cowpunchers had toted six-shooters, frequently causing distress and perturbation to those whom they met. At times their lawlessness reached such high proportions as to make it necessary to employ troops to repress them.⁷⁸ A reporter from Kansas City stated that eighty indictments were returned against the Texas cowboys who made pilgrimages there in droves.⁷⁹ In time sentiment was developed against this lawless group. In 1882, some of the more prominent stockmen went on record as agreeing that the "day of the sixshooter cowboy is passed, and that class should not be employed on the range."⁸⁰ By 1885, practically all of the cattlemen were united in a movement to outlaw the practice of carrying a gun by their employees, since the need for such a weapon was no longer necessary.⁸¹

The fence also made changes in certain aspects of urban life in the West. It was not an unusual practice for cowhands to drive their wild herds directly through the towns and villages when moving over the trails or from one range to the next. In 1882, seven herds passed through the little Texas town of Bandera, and in 1884, Cheyenne reported that "it may be alright to make the thoroughfares of Cheyenne a cow pasture but it certainly isn't calculated to give strangers an exalted opinion of the City to see a lot of forlorn bovines wandering aimlessly about the streets after nightfall."⁸² Cattle herds were not only troublesome to the farmer's crops, but with their long horns they often hooked and tore down the sod shanties.⁸³

Along with permanent settlers in the West came commerce and industry. Railways were given added impetus when stock trails were broken up; slaughter and packing houses were erected in some of the western cities; boards of trade, banks, hotels, and loan companies sprang up, and by 1889, many of the communities in the Panhandle had built small creameries.⁸⁴ Irrigation entered the scheme of prairie life in the late eighties, and with the fencing of the water holes,

⁷⁶ Kansas State Board of Agriculture, *Biennial Report* (1877-8), 1:105, 110, 114, 199; Washburn and Moen, *Fence Laws*, 3-4.

⁷⁷ *National Live-Stock Journal*, 2:676 (Oct. 26, 1886).

⁷⁸ *Cerrillos Comet* (N. Mex.), Feb. 24, 1882.

⁷⁹ *Texas Panhandle*, Feb. 25, 1882.

⁸⁰ *Ibid.* Cowboys were generally cruel to animals. Horses were often beaten "unmercifully and not infrequently crippled and ruined for life."—*Rocky Mountain Husbandman*, June 8, 1882.

⁸¹ *Bad Lands Cow Boy*, Jan. 29, 1885.

⁸² *Democratic Leader*, Jan. 10, 1884; *Galveston Daily News*, Apr. 28, 1882, [p. 2]. See J. N. Hunter, ed., *The Trail Drivers of Texas*, 498 (Nashville, 1925).

⁸³ 48 Congress, 1 Session, *Senate Executive Document 127*, p. 4 (serial 2167).

⁸⁴ *Bad Lands Cow Boy*, Jan. 29, 1885; *Galveston Daily News*, Oct. 4, 1885, [p. 7].

many ranchers had to drill wells and erect windmills.⁸⁵ Barbed-wire fences caused the value of land to increase, especially where the stockmen strove desperately to get hold of it for their range. Land in Texas, that once sold for a few cents per acre, increased more than 100 per cent in value with the introduction of fences.⁸⁶

Fencing of the western plains by the large cattle companies sometimes retarded for a time the building of churches and schools. A petition from some settlers in Pratt County, Kansas, illustrates how the enclosed pastures interfered with such cultural institutions. They asserted that the "fence in many instances runs so near the lands owned or occupied by actual settlers that it interfere[s] *[sic]* with . . . further settlement of the public domain. . . . And your petitioners would further state that the County is now so poorly settled that the present settlement *[sic]* are unable to enjoy *Church* and *School* privaleges, and unless the County settles . . . your petitioners would be compelled to abandon . . . the cheering influences of the *Church & School*."⁸⁷ In certain communities the delivery of mail was delayed and obstructed by the wire fences that stretched for miles across the plains irrespective of roads or trails, and settlers often had to drive miles out of their way to get to the post offices.⁸⁸ The building of roads was retarded, and even the main highways were occasionally reduced to third-rate trails, since the fences compelled the traveler to open and close gates.⁸⁹

Business conditions in several of the western towns were made uncertain by the enclosing of lands and trails. Owing to the difficulties of driving stock through certain parts of the western country, the livestock markets for handling Texas cattle were transitory. In 1870, they were located somewhere near the village of Newton, Kansas; later they were moved to Great Bend, then to Ellsworth, and finally, in 1885, to Dodge City and Hays.⁹⁰ Such a migratory movement of business interests was certainly not conducive to stable urban life.

During the heyday of barbed-wire fencing many parts of the West experienced an era of unprecedented violence, crime, and public immorality. The intense struggle between the "free grasser" and the "fencer" to gain possession of the range and water holes brought on much of this conflict. Commissioner Sparks of the General Land Office, in commenting on this situation, stated that it "is

⁸⁵ *Democratic Leader*, Jan. 8, 29, April 2, 1885; *Rocky Mountain Husbandman*, Aug. 11, 1887; *National Live-Stock Journal* (weekly ed.), 2:102-103 (Feb. 16, 1886).

⁸⁶ *Galveston Daily News*, Jan. 31, 1882, [p. 4]. Ellwood estimated that barbed wire had increased the value of land in parts of the West as much as "five dollars per acre."—*Glidden Barb Fence Journal*, 4:1-16 (1883).

⁸⁷ James Jenkins to H. M. Teller, Pratt County, Kans., May 26, 1883 (No. 50,211), and in 48 Congress, 1 Session, *Senate Executive Document 127*, p. 12-13 (serial 2167).

⁸⁸ W. O. Graham to H. M. Teller, Washington, D. C., Apr. 23, 1883 (No. 38,210).

⁸⁹ L. S. Perry to H. M. Teller, Hatton, Colo., Mar. 31, 1883 (No. 34,091); *Burke's Texas Almanac*, 150. Intimidation signs were common on the fences. One homesteader reported that if the signs were ignored in his community a cowboy "just points his Henry rifle in the direction where it will do the most good."—48 Congress, 1 Session, *Senate Executive Document 127*, p. 3, 22 (serial 2167).

⁹⁰ 48 Congress, 2 Session, *House Executive Document 267*, p. 28 (serial 2304).

doubtful if the world has ever witnessed such criminal prodigality. . . . Whole counties have been fenced in by the cattle companies, native and foreign, and the frauds that have been carried on by individuals on a small scale are simply innumerable."⁹¹ In the race to gain control, barbed wire was thrown up everywhere, irrespective of titles, roads, or laws. Cowboys, aunts, uncles, and cousins were conscripted to hold down homesteads and to squeeze out the small farmer and stockman.⁹² The Texas Land Office reported that over one hundred thousand square miles of land in the State were held by occupants who were "there in violation of law" and that "appeal to the local civil authorities" in that unorganized territory was useless.⁹³

As a result of this tense situation people became violent and destructive. A fence-cutting war which started in Texas extended even as far north as Montana before it subsided. People were killed, property was destroyed, business was crippled, and peaceful people were alienated against one another.⁹⁴ A special report from Las Vegas, New Mexico, described the extent of organization of the fence cutters in that area. Mounted and placed in squads of convenient number, they would ride up to the fence, a man would drop off at a corner and cut half a mile or more to where the next man had begun, then jump into his saddle and rush to the head of the line again, after the fashion of school boys playing leap frog.⁹⁵ A number of reasons have been given for this unusual destruction, but a series of letters in the *Galveston News* throw some interesting light on the social and economic theories that actuated many of the cutters. Apparently the motives behind much of this disturbance were diverse, for small farmers as well as large stockmen experienced the nippers alike.⁹⁶ One writer stated that the fence cutting was incited by the theories of communism; another said it was greenbackism; while another remarked that it was agrarianism.⁹⁷ "Agrarianism," one correspondent wrote, "is a system of spoliation," while "Communism is, in the highest degree, salvatory in its tendencies."⁹⁸ In this case agrarianism probably meant big pastures with their attendant monopolistic control, while communism involved a free and open range. Those who favored the big pastures argued that the free and open ranges had been "the parent of

⁹¹ *Democratic Leader*, Dec. 10, 1885.

⁹² Texas General Land Office, *Report* (1878-80), 28; *Galveston Daily News*, Feb. 5, 1882; F. L. Paxson, "The Cow Country," 65-82.

⁹³ Texas General Land Office, *Report* (1884-86), 7.

⁹⁴ *Rocky Mountain Husbandman*, Nov. 6, 1890; *Breeder's Gazette*, 4:890 (Dec. 27, 1883); *Galveston Daily News*, Sept. 1, 1886, p. 2; W. C. Holden, *The Spur Ranch*, 64-68 (Boston, 1934).

⁹⁵ *Iron Age*, 35(4):31 (Jan. 22, 1885).

⁹⁶ *Galveston Daily News*, Nov. 28, 1883, [p. 3]. See W. P. Webb, *The Great Plains*, 238-239 (Boston, 1931); Louis Pelzer, *The Cattlemen's Frontier*, 173-191 (Glendale, Calif., 1936).

⁹⁷ *Galveston Daily News*, Nov. 28 [p. 3], Dec. 3 [p. 2], 7 [p. 2], 23 [p. 3], 1883. See R. D. Holt, "The Introduction of Barbed Wire into Texas and the Fence Cutting War," West Texas Historical Association, *Year Book*, 6:70-79 (June 1930).

⁹⁸ *Galveston Daily News*, Nov. 28, [p. 2], Dec. 7, 1883 [p. 2].

crime in Texas. It has been the educator of the mavericker, the brand blotcher, cattle-thief and the fence-cutter."⁹⁹

These barbed-wire fences affected many groups and, as a consequence, many classes were directly or indirectly involved. The building of pastures tended to throw cowboys out of work, and small stock owners claimed that the large owners fenced them away from water, roads, and business centers. Sheepmen as a rule opposed the closing of the free range, and to the rustler the barbed-wire fence was a natural detective.¹⁰⁰ Thus, the cutting of fences was not opposed by many groups of people. A quotation from one of the contemporaries of that day shows how universal its acceptance actually was. "Fence cutting never would have become so great and destructive if it had not met with such popular sentiment. Men of influence gave expression of favor. Many good men 'winked' at it until it had gone from the highest to the lowest. It found its way to the fireside of every home, and the grievances [*sic*] of the lawless element of the communistic fence-cutters were held up in glowing colors."¹⁰¹

Fencing helped to eliminate some of the difficulties connected with tax collecting. Where cattle were allowed to roam over the range, the owners were able to escape taxation, for it was difficult to ascertain exact numbers. This situation militated against fencing the ranges, since many of the stockmen wanted to be able to drive from one county to another in order to avoid tax collectors. In some areas this procedure became such a common practice that collectors sought to tax all cattle in their jurisdictions, even if they belonged to stockmen in adjoining counties.¹⁰² In some parts of the West such conditions brought on strained relations between the cattlemen and the permanent propertied class. A letter from a settler in Harper County, Kansas, expressed the situation as follows: "In the name of God, I ask, is this a republican form of government, when the poor man, with barely enough to keep soul and body together and pay for his 160 acres of land, must pay the taxes of the country and the cattle kings go free? If so, I was a big fool to spend three years of my life to defend such a country."¹⁰³

Barbed wire also entered the political arena. Large cattlemen were influential with governors and legislators, and through powerful livestock associations, often brought pressure to bear not only upon them but on presidents as well. In 1884, the Governor of Texas was compelled to call a special session of the Legislature to cope with fence-cutting problems.¹⁰⁴ The same year the cattlemen of Wyoming and Colorado sent a memorial to their Congressmen stating that they did "not advocate, in theory or practice, the system of enclosing with

⁹⁹ *Ibid.*, Dec. 3, 23, 1883, [p. 2, 3].

¹⁰⁰ *Ibid.*, Dec. 7, 1883, [p. 2]; *Breeder's Gazette*, 4:169 (Aug. 9, 1883).

¹⁰¹ *Galveston Daily News*, Dec. 13, 1885.

¹⁰² *Denver Tribune*, Jan. 1, 1880; 48 Congress, 2 Session, *House Executive Document* 267, p. 102 (serial 2304); *Democratic Leader*, Feb. 21, 1884; *Rocky Mountain Husbandman*, Jan. 15, 25, 1885.

¹⁰³ 48 Congress, 1 Session, *Senate Executive Document* 127, p. 14 (serial 2167).

¹⁰⁴ *Democratic Leader*, Jan. 31, 1884; Webb, *Great Plains*, 316 n.

fence large bodies of public land."¹⁰⁵ Lobbyists employed by the stockmen were common at the seats of government where they fought desperately to protect their rights and to nullify "all attempts to break up the cattle interests."¹⁰⁶ In 1888, a reporter from Wyoming remarked that the Legislature had been "favorable to the range interests" for years.¹⁰⁷ General B. F. Butler was a favorite with many cowmen, not only because of his legal talent, but because he held large interests in ranches. He was occasionally employed by cattlemen to investigate land titles and defend them against Government encroachment as well as promote their national programs.¹⁰⁸ Small farmers likewise entered politics in order to protect their interests. They filed countless petitions of redress and opposition with their Congressmen, and also retained legal talent.¹⁰⁹ Ex-Congressman W. A. Hall of Missouri used his good offices with J. B. Belford, a Representative from Colorado, with the hope of forcing the Prairie Cattle Company to remove its fences. In a letter to Belford, he said: "I believe I can influence a number of the Missouri delegation to co-operate with you in remedying the [fence] evils . . . if you wish it."¹¹⁰

Barbed-wire manufacturers were also prominent in political circles. They contributed freely to campaign chests in both State and National elections, and at times were able to even elect some of their own group to high office.¹¹¹ The Governor of Illinois conferred the honorary commission of colonel on a number of them.¹¹² Albert B. Cummins, later United States Senator from Iowa, was a member of the board of directors of the Barker Wire Company at Des Moines, and first rose to prominence among the farmers of Iowa because of his fight against the barbed-wire trust.¹¹³ A number of legislators in the Western States capitalized on the rural vote by introducing measures against the patent system which was stimulated largely by the influence of the drive-well and barbed-wire patents.¹¹⁴ This agitation was so strong among the farmers that the Iowa

¹⁰⁵ *Democratic Leader*, Mar. 6, 1884.

¹⁰⁶ *Ibid.*, Jan. 31, 1884.

¹⁰⁷ *Breeder's Gazette*, 13:102 (Feb. 1, 1888).

¹⁰⁸ A. Ames to B. F. Butler, New York, Apr. 2, 1883 (Butler Papers, Manuscript Division, Library of Congress); Thomas Carney to B. F. Butler, Kansas City, Mar. 4, 1887; *Democratic Leader*, Sept. 1, 1885. The cattlemen attempted to engage Butler as their legal representative to fight President Cleveland's illegal fencing proclamation.—*Ibid.*, Sept. 3, 13, 1885; *Galveston Daily News*, Sept. 1, 1885, p. 1.

¹⁰⁹ Louis Pgoetz to H. M. Teller, San Francisco, May 11, 1887 (No. 52,711); *Democratic Leader*, Feb. 5, 1885; *River Press*, Dec. 17, 1884.

¹¹⁰ W. A. Hall to J. B. Belford, Kaseyville, Mo., Jan. 6, 1884 (No. 5,354).

¹¹¹ J. W. Gates to J. W. Noble, Pittsburgh, Feb. 5, 1884 (DeA 37); *True Republican*, Oct. 25, 1884, Oct. 21, 1888; *De Kalb Chronicle*, Oct. 20, Nov. 20, 1888.

¹¹² *Iron Age*, 59:21 (Feb. 11, 1897).

¹¹³ "Organization and Proceedings of the Board of Directors of the Baker Wire Company," 10 (Des Moines, 1883-84, DeA 34); Johnson Brigham, "The Governor of Iowa; A Sketch of Albert Baird Cummins," *American Monthly Review of Reviews*, 34:291-295 (September 1906).

¹¹⁴ *Industrial World and Iron Worker*, Feb. 14, Mar. 20, 1884; *Iowa State Register*, Feb. 23, 1881, Jan. 5, 1887.

Legislature passed a resolution, requesting the President of the United States to have his Attorney General bring suit against the barbed-wire trust in order to set aside all their patents. Two years later, this same body passed by a two-thirds vote an appropriation of \$5,000 to aid the farmers in fighting the barbed-wire monopoly.¹¹⁵ The rebellion of the farmers in the West against these patents was so vigorous that it stirred the inventors throughout the Nation to organize an association to look after their interests.¹¹⁶ In 1879, even Thomas A. Edison was drawn into the squabble, and he made a direct appeal to General Butler to use what political influence he had to protect the patent system.¹¹⁷ The inventors held a national convention with delegates from every section of the land to stem the tide of agitation against the patent system, and a delegation was despatched to the platform committee of the Democratic Party to seek their support.¹¹⁸

Finally, barbed-wire fences aided in the downfall of the cattle companies as well as the "cow culture" that had developed on the Western Plains during the seventies and eighties. When trail driving disappeared—largely because of the fences—this cultural pattern began to decline, and in its place came, with the influx of the grangers, an economic and social structure that was built, in part at least, on an agricultural system of corn, wheat, and cotton.¹¹⁹

The failure of many of the large cattle companies was due to a large extent to the financial burden incurred in the fencing of large tracts of land. The profits in the business were not adequate to support a debt structure such as many of them contracted during the boom days, and as a result the crash came, ruining many of the best companies.¹²⁰ Even as early as 1883, the western press gave forewarnings to the rapidly expanding industry. The *Texas Live Stock Journal* reported that the "million-acre ranch will soon have to submit to the dissecting knife"; which will inevitably bring an "end to the cattle business on these plains"; the Mobeetie (Texas) *Panhandle* said that "Since the advent of the fencing feature on the ranges, we have been expecting that stockmen might become possessed of too much live property for their own good. Land and fences are a

¹¹⁵ *Iowa State Register*, Mar. 11, 1882, Apr. 2, 1884. J. B. Weaver of Iowa was chairman of the Patent Committee in 1886.—50 Congress, 1 Session, *House Reports* 1959, 6:1-2 (serial 2603).

¹¹⁶ *Industrial World and Iron Worker*, Feb. 14, Apr. 24, 1884; *Iowa State Register*, July 30, 1884.

¹¹⁷ Thomas A. Edison to B. F. Butler, Menlo Park, N. J., Feb. 17, 1879. This letter was provoked by pleas from other inventors. After narrating his own grievances, he said: "I have spoken of myself and my inventions only in order to protest in the interest of all other inventors against any legislation calculated to make our traditional struggle against the capitalists any more difficult."

¹¹⁸ *Industrial World and Iron Worker*, July 17, 1884. Barbed wire occasioned so much interest and discussion that the U. S. Patent Office displayed the Glidden patent in its "hall of fame."—*Iron Age*, 117:1774 (June 24, 1926).

¹¹⁹ Cauley, "Early Business Methods in the Texas Cattle Industry," 480, 486.

¹²⁰ 50 Congress, 1 Session, *House Executive Document* 1, p. 1059 (serial 2541); *Iowa State Register*, May 20, 1887.

heavy expense added where before was none, with no present visible income for the sums invested; and the temptation to add a few more head [of cattle] to increase the profits must cause a man's natural desire for gain to place a constant strain on his judgment."¹²¹

By 1888, most of the leading livestock journals had rung down the curtain on the large pastures with their "bristling barbs." The following comment in the *El Paso Tribune* reflects the attitude of many Westerners: "When one has to lease land in Texas, buy water fronts . . . and build fences, his fate is sealed."¹²² Another commentator wrote that the cattle industry "once held in such high esteem by capitalists, is in a very crippled condition. Every man who has money in it is anxious to leave the ship."¹²³ The industry had overexpanded, and as a result a new chapter was ushered in on the plains. The stockmen and small farmers with their better breeds of cattle, better management, better grass, and smaller herds had come to stay. Barbed-wire fencing had played its part in bringing about this transition.

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¹²¹ *Texas Live Stock Journal*, 8(5):8 (Sept. 3, 1887); *Breeder's Gazette*, 4:526 (Oct. 18, 1883).

¹²² *Texas Live Stock Journal*, 8(48):12 (June 30, 1888).

¹²³ *Breeder's Gazette*, 16:580 (Dec. 18, 1889); E. E. Dale, "The Romance of the Range," *West Texas Historical Association, Year Book*, 5:3-22 (June 1929).

THE MANAGEMENT OF A RICE PLANTATION IN GEORGIA,
1834-1861, AS REVEALED IN THE JOURNAL OF
HUGH FRASER GRANT

ALBERT V. HOUSE, JR.

Descriptive and documentary accounts of the geographical and economic factors which influenced eighteenth and nineteenth century rice culture on the tide-flow plantations of the Carolinas and Georgia have usually been largely concerned with conditions in the lands originally granted to the "Eight Noble Lords." Carolina items outnumber Georgia entries by a very wide margin in published bibliographies on the subject.¹ This fact may be partially explained by the usual assumption of most writers that Georgia and Carolina practices differed in very minor details only. With rare exceptions, most narratives seem to be based on Carolina sources. Even the works of Ulrich B. Phillips, the dean of historical investigators of the plantation system, have only fragmentary evidence on Georgia rice culture. To be sure, his monumental collection of *Plantation and Frontier* documents includes some thirty-two pages dealing with rice culture in Georgia,² but they do not contain a record completely satisfactory to those interested in the significant details of Georgia rice growing. Over half of these documents dealing with rice are in the nature of *yearly summaries* of crops, weather, labor, prices, and expenses on a rather small rice plantation on Argyle Island in the Savannah River, while the remaining pages are concerned with a sea-island plantation primarily devoted to cotton but which incidentally raised a little rice. A journal, an account book, a diary, or considerable personal correspondence by a Georgia plantation owner whose major crop was rice, but who, by contrast, raised very little sea-island cotton, would be of greater value in determining plantation routine and financial transactions in the Georgia rice district.

A cursory analysis of the methods and materials used by other writers on rice will still further reveal the scarcity of reliable information on the Georgia rice fields. Among the early writers, Fanny Kemble's vituperative harangue on slave conditions on a sea-island plantation can be largely discounted on the basis of preconceived bias and meager training as a skilled observer of agricul-

¹ E. E. Edwards, "A Bibliography of the History of Agriculture in the United States," U. S. Department of Agriculture, *Miscellaneous Publication* 84, p. 75-76, 113, 151-152 (Washington, 1930). In addition to offering many valuable suggestions for this article, E. E. Edwards kindly loaned a copy of his "History of Rice Production in the United States; A Comprehensive List of Annotated References," (MS., Washington, D. C., U. S. Department of Agriculture, Bureau of Agricultural Economics, May 15, 1931, 10 p., typewritten). See also A. S. Salley, "Bibliography of the Rice Industry in South Carolina," in David Doar, *Rice and Rice Planting in the South Carolina Low Country*, 54-68 (Charleston, 1936).

² U. B. Phillips, ed., *Plantation and Frontier (A Documentary History of American Industrial Society*, v. 1-2), 1:134-166 (Cleveland, 1910).

tural methods.³ In spite of his honest attempt to follow the instructions of his editor to "write his unbiased impressions of slavery and of actual economic and social conditions in the South,"⁴ Frederick Law Olmsted cannot be rated much above the unhappy English actress as a commentator on Georgia rice plantations. His interest was primarily slave labor rather than agricultural techniques. He relied very heavily on quotations from the *Southern Agriculturist*, the *South Carolinian*, and the *New Orleans Delta* and seemingly visited no rice plantations in Georgia. Solon Robinson, a much more competent observer of agricultural activities, likewise failed to visit the rice plantations of Oglethorpe's first settlements, although his reports of his two tours of Dean Hall and Jehossee Island in South Carolina are masterful in detail and scope.⁵ The series of articles on rice by Governor Robert F. W. Allston in *De Bow's Review* are also highly commendable and somewhat scholarly descriptions of rice culture in the Carolinas, Louisiana, and many other parts of the world, but do not include Georgia, except by inference.⁶

The past two decades have seen a series of excellent studies on various phases of the American rice industry, past and present. The 1922 *Yearbook* of the United States Department of Agriculture contains a brief section devoted exclusively to rice, complete with maps and graphs of prices, production, milling, and markets, as well as exports and imports for the previous century.⁷ This able summary is concerned largely with twentieth century conditions, thus little on the older production areas is included. In 1927, Arthur H. Cole's brilliant study of the contemporary status of the "American Rice-Growing Industry" appeared, but the historical portions were used only as a foil for a revealing study of the revolution which has taken place in cultivation techniques.⁸ In very recent years, specialized studies of rice in South Carolina have been published by two capable native sons of the Palmetto State.⁹ The first by David Doar, entitled *Rice and Rice Planting in the South Carolina Low Country*, is a

³ Frances A. Kemble, *Journal of a Residence on a Georgian Plantation in 1838-39* (New York, 1863).

⁴ T. K. Hubbard, "Frederick Law Olmsted," *Dictionary of American Biography*, 14:25 (New York, 1934). See also Broadus Mitchell, *Frederick Law Olmsted, A Critic of the Old South* (Baltimore, 1924); F. L. Olmsted, *A Journey in the Seaboard Slave States*, 462-488 (New York, 1859).

⁵ H. A. Kellar, ed., *Solon Robinson, Pioneer and Agriculturist*, 2:349-355, 364-368 (Indianapolis, 1936).

⁶ *DeBow's Review* (Charleston), 1:320-356 (April 1846); 4:502-511 (December 1847); 16:589-615 (June 1854).

⁷ U. S. Department of Agriculture, *Yearbook*, 1922, p. 512-525. E. B. Copeland, *Rice* (London, 1924), is another meritorious general study, devoted largely to such technical problems as climate, soil, disease, seed, and production methods in contemporary rice culture, with little or no historical material.

⁸ A. H. Cole, "The American Rice-Growing Industry: A Study of Comparative Advantage," *Quarterly Journal of Economics*, 41:595-643 (August 1927).

⁹ David Doar, *Rice and Rice Planting in the South Carolina Low Country* (Charleston, 1936); D. C. Heyward, *Seed from Madagascar* (Chapel Hill, 1937).

rather adequate historical study based on considerable research, but the delightful blend of scholarship, autobiography, and family history from the pen of Duncan C. Heyward, entitled *Seed from Madagascar*, is more choice reading. The author is the last rice planter in the family of Nathaniel Heyward whose amazing holdings of rice lands previously had been given a prominent place by Phillips in his *American Negro Slavery*.¹⁰ Using family records, elementary principles of cost accounting, and some shrewd deductions, Heyward made a noteworthy attempt to arrive at some definite conclusion as to the cost of producing a bushel of rice with slave labor, but had to admit partial failure, due to incomplete records of accounts with the family factors in Charleston.¹¹

A perusal of L. C. Gray's monumental *History of Agriculture in the Southern United States* still further illustrates the paucity of either descriptive passages or documentary sources on the Georgia rice lands.¹² Gray's study contains a polished and rather definitive study of rice growing in the Carolinas during the colonial period, with, however, less than a paragraph on Georgia conditions. There is evidence of his having used varied manuscript and printed sources of an unusual nature, but the sketch of rice in the post-colonial period is somewhat disappointing to the historian, although possibly not to the economist. Reliance has been placed on articles in the local and agricultural press, local histories, *Affleck's Southern Rural Almanac*, and commercial periodicals such as *Hunt's Merchants' Magazine* and *De Bow's Review*. In addition, statistics from State records, *Senate Reports*, and the United States Census were used. While all such sources must be the backbone and flesh of any study of the South, the life blood can be supplied only by manuscript plantation records. Gray seemingly made slight use of even those selections by Phillips which previously had appeared in print. Again, it is disappointing to find only one or two references to Georgia.

A comparison of the chapter on "Types of Large Plantations" in Phillip's *American Negro Slavery* with the rice records in his *Plantation and Frontier* suggests that even after two decades of ransacking the manuscript sources on Southern history, he had failed to turn up any considerable volume of records dealing solely with rice culture in the tide-flow region between the Savannah and Altamaha rivers.¹³ Such a comparison inclines the student to agree with the observation contained in a recent historiographical essay on Professor Phillips, in which the "charge" was made that "he was accustomed to work and re-work his materials until almost the last possible bit of utility had been squeezed from them."¹⁴ The pages on rice in *American Negro Slavery* are little more than an

¹⁰ U. B. Phillips, *American Negro Slavery*, 249-251 (New York, 1918).

¹¹ Heyward, *Seed from Madagascar*, 82-86.

¹² L. C. Gray, *History of Agriculture in the Southern United States to 1860*, p. 277-290, 721-731 (Washington, 1933).

¹³ Phillips, *American Negro Slavery*, 247-259, and *Plantation and Frontier*, 1:134-166.

¹⁴ Wood Gray, "Ulrich Bonnell Phillips," W. T. Hutchinson, ed., *The Marcus W. Jerne-gan Essays in American Historiography*, 369 (Chicago, 1937).

interpretation of previously published excerpts from the Louis Manigault manuscripts, supplemented—one might almost say padded—by the observations of Olmsted, Solon Robinson, and Fanny Kemble.

Obviously no one manuscript or even collection of plantation records would entirely fill the gaps in available knowledge of Georgia rice culture. However, the journal and account book of Hugh Fraser Grant of "Elizafield," Glynn County, Georgia, supplies the key to many aspects of the problem.¹⁵ Grant was undoubtedly one of the leading citizens of his county. He reported \$40,000 worth of real estate to the census takers in 1850.¹⁶ This figure was raised to \$50,000 by 1860, despite the intervening loss of considerable property by fire. He also reported \$73,000 worth of personal property, including slaves, in that same year.¹⁷ According to the census records, he was the second largest farmer in Glynn County which, it is important to notice, included St. Simon's Island. Grant started his career in 1834 at the age of twenty-four on Elizafield, which, according to his own annual tax returns for the years 1845-1850, comprised approximately 1,790 acres. He classified this land as 300 acres of rice land, 1,400 acres of pine lands, and about 90 acres of second-quality hammock lands. During the quarter century of his ownership, he acquired more acres but never harvested in any one year more than 355 acres of rice, and 100 acres of corn, peas, etc., from the "high lands." These acres were located on the banks of the Altamaha River on the site of the old Mission of Santo Domingo de Talaje. Grant later acquired adjoining lands known as "Evelyn" and "Grantley," eventually selling the former to Thomas Pinckney Huger, a neighbor. Elizafield, the parent plantation, was purchased in the 1920's by William du Pont, of the du Pont De Nemours Company, who has carefully preserved the antebellum atmosphere of the estate.¹⁸

Grant's neighbors included nephews and nieces of former Governor George M. Troup, the rebellious executive who fought with Presidents Monroe and Adams over the removal of Indian tribes from Georgia.¹⁹ Another neighbor was Thomas Butler King, the "reformed" Yankee, who during his amazing career was a member of Congress, collector of the port of San Francisco, and in

¹⁵ This journal is owned by Samuel Gottleib of Washington, D. C., and was loaned to the writer at the request of Raymond Israel, one of his former students.

¹⁶ U. S. Census Office, Seventh Census, 1850, MSS., Volume on Glynn County, Georgia, 5. The writer is indebted to Philip Mack Smith, "Queries and Answers" editor of *The American Genealogist*, and to Anne H. Cochrane of Madison, Wisconsin, for their many valuable suggestions relating to the local history of "Elizafield" and its owners.

¹⁷ U. S. Census Office, Eighth Census, 1860, MSS., Volume on Glynn County, Georgia, 221-229.

¹⁸ Margaret D. Cate, *Our Todays and Yesterdays; A Story of Brunswick and the Coastal Islands*, 17-19 (Brunswick, Ga., 1926).

¹⁹ U. S. Census Office, Eighth Census, 1860, MSS., Volume on Glynn County, Georgia, 228; E. M. Coulter, *A Short History of Georgia*, 212 (Chapel Hill, 1933); F. M. Green, "George Michael Troup," *Dictionary of American Biography*, 18:650-651 (New York, 1936).

1861, on commission of Governor Joe Brown, special agent to various European countries for the "Independent State of Georgia."²⁰

Any fairly complete record of the activities of the owner of Elizafield is obviously a remarkable addition to the source material on rice culture in Georgia. Despite the fact that the journal at hand is only a single substantial volume of about two hundred and thirty-five pages, and even though some key pages such as the tax returns for 1834-1844 have been cut out, a multitude of significant detail for the years 1834-1861 has been preserved. During the planting and harvesting seasons, the owner made entries almost daily. This record was carried under various headings, comprising the debtor and creditor accounts with three or more factors, the weather, the condition and progress of the rice on thirteen separate fields, including a separate page for each field during the years 1839-1847, the amount of seed used on each field, and the progress of harvesting and threshing as well as many other items, including the total yield for the year. True, this journal is one volume only, and thus it cannot be compared with the extensive collections used by Phillips, notably the Louis Manigault and the George Noble Jones papers.²¹ It must also be admitted that a hurried reading of this volume substantiates the general conclusions of Phillips, Gray, and others, but the wealth of detail here recorded could be used as the basis of a series of short studies on comparative practice and advantage. For instance, the brief "separate" journals for each field include necessary figures on dates of planting, sprout, point, harvest flows, amount of seed used, and, occasionally, the yield on each field. If checked with the larger journal and the accounts of rice shipped to the factors, it would be possible to estimate the number of field-hand days and total yield, thus offering additional light on the problem of estimating the cost of producing a bushel of rice under slave labor, the riddle which Heyward attempted unsuccessfully to solve. Seasonal differences as compared with the Carolinas can also be charted. These variations were due somewhat to the weather and the tides, but also to the fact that the slave labor force spent variable periods at work on auxiliary food crops, which, in turn, was true because of the differing amount of "high lands" available for such crops. Next, sufficient data are scattered throughout the volume for a study of the evolution of more efficient techniques in the planting, culture, harvesting, and threshing of rice during the three decades before the Civil War. Finally, the accounts with the factors are extensive and continuous, thus inviting careful study by students of marketing and finance.

A preliminary analysis of the short journals which Grant maintained for each of his fields is enlightening. These were faithfully kept until 1848; thereafter, the information was incorporated in the daily journal. At first glance there seems to be neither rhyme nor reason to the varying practices recorded for each

²⁰ E. M. Coulter, "Thomas Butler King," *Dictionary of American Biography*, 10:403 (New York, 1933).

²¹ U. B. Phillips and J. D. Glunt, eds., *Florida Plantation Records from the Papers of George Noble Jones* (St. Louis, 1927).

field.²² Some fields were planted as early as March 8, and others as late as April 18; some were plowed and harrowed before planting; others were merely turned with hoes. In some fields the seed was covered before watering; in others the flow was turned on immediately after being seeded. The length of each flow varied from field to field and from year to year. Most fields received from 2 to 2½ bushels of seed per acre, but as much as 3 bushels was strewn on new lands. The average number of days from planting to harvesting was about 165, but cases of 183 and 148 days are recorded. A severe freshet or "flood" covered each of the fields which were out of line with the usual average, but the excess water seems to have brought radically different results in each case. These variations in all steps of cultivation seem to confound most writers on the subject who insist that there was a typical or usual procedure which most planters followed. In his last book, *Life and Labor in the Old South*, Phillips made a tentative attempt to correct this misunderstanding with the succinct observation that "if these [seeds] had previously been 'clayed' by soaking in mud, the water was at once let on to cover the furrows and sprout the crop. But if unclayed seed were used they were covered lightly by hoeing and the 'sprout flow' was omitted. Some planters followed one plan and some the other."²³ Still further light on this seemingly planless activity of Grant is cast by Edwin B. Copeland's measured judgment that:

Every grower must in practice be his own rice doctor or have none at most times. His eye should tell him from day to day whether or not his field is thrifty. . . . If the condition is bad, a *prompt* diagnosis, and correction if possible, is the only chance. For rice usually has at best no more time than it needs, and is likely to mature a bad crop instead of delaying it. As a general proposition, the most that can be hoped for is to mitigate the damage, by the time injury is evident, unless the application of more or less water is a promising remedy.²⁴

Scattered throughout the Grant volume are short journals or separate entries giving the seasonal history of the crops planted on the "high lands." These included potatoes, peas, corn, and some sea-island cotton.²⁵ It is apparent that Grant did not possess sufficient land of this type to feed his slaves since more than half of the years contain notations of purchases of food crops from the factors.²⁶ Cotton production was especially small, and some years found none planted.

The extensive, general daily journal is by far the most interesting portion of the record. The variety of information, the provincial phrases, and the touching

²² Unless otherwise cited the source of all subsequent statements is the Grant journal itself. Incomplete numbering of the pages prevents exact citations.

²³ U. B. Phillips, *Life and Labor in the Old South*, 115 (Boston, 1929).

²⁴ Copeland, *Rice*, 54.

²⁵ A half century later a promotional blurb of the Brunswick, Georgia, Board of Trade insisted that "on these black hammock lands—corn grows like it does in Illinois, Iowa, Missouri and Kansas."—H. W. Reed, ed., *Brunswick, Georgia and Glynn County*, 13 (Brunswick, 1895).

²⁶ Another possible explanation is that Grant felt he would secure greater returns from his slave labor if he kept it busy on the productive rice lands and purchased cheap foods.

personal sidelights and observations reveal much of the man and his work. He meticulously recorded the temperature, the tides, the progress of all stages of the plantation tasks, including plowing, hoeing, cutting, and threshing. He also set down the time consumed in repairing trunks, canals, and banks; then he called attention to an epidemic of whooping cough among the slaves, and a scourge of "bilious fever" which attacked him and three other members of his family. This was soon followed by the flight of the entire family far beyond the usual nearby summer home to the "mountains." At one time he thankfully boasted that the rice birds had not arrived, and three days later, disconsolately admitted that these devastating birds had descended on his lands in droves. The purchase on November 9, 1844 of a "15 Horse Power-Piston engine for \$350" for use in threshing, and the successful operation of this machine on January 30, 1845 are possibly the most significant items in the entire journal.

Memoranda on family life, social activities, and political views are few and far between. The family, of course, moved to the summer home in early spring and stayed until frost in the fall. In 1851, Grant's mother and younger daughters took a trip to New York to meet the oldest daughter who was just finishing a tour of Europe. Grant's confirmation at the age of thirty-three in St. Andrew's Church was recorded on March 24, 1844. A long, flowery address by Captain Hugh F. Grant to the Glynn County Rangers on the occasion of the presentation of their colors in 1849 was set down verbatim for posterity. Three times only in more than a quarter of a century did politics intrude upon the sanctity of the daily journal; each entry being almost a classic in its thought and wording: *first*, "October 2, 1855. At the Election yesterday between T. T. Long democrat and T. B. King Know-nothing for Senate T. T. Long elected by 40 majority—The greatest triumph ever known in Glynn County"; *second*, "November 4, 1856. Election for President, Buchannon, Filmore & Fremont 3 Candidates. Good Rain"; *third*, "Waresboro, Ware County 1861, Oct. 26. Moved my family & part of the Negroes here out of the way of the Vandal Yankees." Still another personal touch is added by a half page of instructions for a concoction which sounds like a vicious brew but carries the title, "Cholera Medicine." Another vile mixture appears as a "Cure for the Itch in $\frac{1}{2}$ hour." Other sure-fire remedies for the many ills which afflicted his horses and the social diseases which distressed his slaves are memorialized on pages conveniently adjacent to the index.

Other blocks of data were classified under the headings of "Overseer's Accounts," "Account of Cattle," "List of Slaves," and "Tax Returns." A comparison of the advances given two different overseers provides a partial explanation of the contrasting judgments recorded by Grant when the services of each were terminated. Benjamin Talbot of Boston served four years, only to die in the harness. His employer characterized him as "a very efficient man and a great loss to me." Talbot's account included a double-barrel gun, coffee, soap, socks, cloth, boots, ham, a bay mare, plates and crockery, "333 segars," "1 Hog," and a "Florida excursion." Thomas Skinner lasted less than eight

months as overseer, being discharged for "non attendance to business" on August 29, 1842. His account listed a double-barrel gun, varnish, "1 doz. pints porter," a saddle, cash, buck shot, and a padlock.

In May 1846, Grant listed his cattle as follows: 15 cows, 13 calves, 13 yearlings, 3 steers, 6 oxen, 1 bull,—a total of 51 head. In September 1857, he listed: 11 oxen and 2 strays, 21 cows, 6 3-year-old steers, 2 yearling steers, 9 spring calves (steers), 5 heifers, 1 bull (stray),—a total of 54 head and 3 strays. The surprising feature of these lists is the comparatively large number of cows, since most accounts of plantation existence give the impression that both cows and pigs were scarce.

The slave lists are roughly comparable to those printed by Phillips in his *Plantation and Frontier* volumes.²⁷ Four (originally six) pages show the slaves on the plantation when Grant began operations in 1834 and those added by purchase and birth before 1851. Surprisingly, during this period only thirteen slaves were sold, and seven of these had been purchased a short time before their sale. Grant was evidently indulging in a bit of speculation since a pencil notation figured a profit of \$1,390 accruing from the difference between their purchase price of \$1,760 and the sale price of \$3,150. Six slaves were bought for \$3,000, and four and one-half pages were sufficient to list births during the seventeen years prior to 1851. A new and revised list of the slaves at Elizafield in 1851 completes the cataloging of the labor force. The really small number bought and sold out of a total which averaged well over a hundred in the 1840's would seem to substantiate the contention of writers who claim that slaves were seldom sold on rice plantations. Other information on relations with the slaves appears on nearly every page of the daily journal, with mention of gifts, rewards, supplies, and holidays granted. One of the more interesting items is an obscure entry which reveals that the master purchased 31,500 shingles from four of his slaves at \$1 per thousand.

The tax returns for each year after 1845 are brief, but offer a check on the total land figures, the slaves, and other property. Returns for 1854 and thereafter mention "1 poll," which suggests that poll taxes had not been levied previously in Georgia. The 1849 return listed two wheel carriages, and that of 1854, furniture valued at \$1,200. Slaves were figured at \$400 each; the total number varying from 105 in 1845 to 126 in 1856.

Grant's dealings with factors may or may not have been typical, but he most decidedly did not confine his trading to one establishment. From 1834 to 1840, he operated through two factors in South Carolina. Most of his produce was shipped to Robertson and Thurston (later Robertson and Blacklock) of 18 East Bay Street, Charleston, but he also did business with Robert Hogan at 32 Vendues Range, who apparently had Grant ship some of his crop directly to New York. In 1840, he began sending all of the rice from Elizafield to R. Habersham & Company of 137 Bay Street, Savannah. This factorage was one of the oldest and largest concerns of the day, having been founded in 1744 by

²⁷ Phillips, *Plantation and Frontier*, 135-140.

James Habersham, an early settler who was a friend of both George Whitefield and James Oglethorpe.²⁸ However, Grant continued to ship the rice and cotton from the Evelyn plantation to Hogan until 1842, when he gradually sent less and less to Charleston and more to Mitchell and Mine of 102 Bay Street, Savannah. This connection, in turn, was ended between 1845 and 1850, possibly because of the sale of Evelyn to Pinckney Huger. Beginning in 1852, Grant sent all of the rice and cotton from Grantley, his new plantation, to N. A. Harder & Company of Savannah. The practice of shipping the crop of separate plantations to different factors may have many explanations. Possibly it was due to available transportation facilities. Again, continued handling of the crop of a certain plantation may have given the factors a quasi-vested right to handle the output of those acres. It may have been due to the available credit facilities and types of supplies which different factors could supply. Finally, it may have been merely another illustration of that old adage which runs,—never put all of your eggs in one basket. Grant also carried short accounts in 1842, 1843, and 1854 with Tunno, Pinckney & Company of Savannah, which is possibly another demonstration of his caution.

The gross sales to all factors are listed in separate entries from 1841 to 1845 and, thereafter, are located under the heading of "Contra" accounts with the factors. These varied from 5,000 bushels of rice in 1841 to 14,277 bushels in 1857 and in value from \$1,938.96 in 1841 to \$15,343.65 in 1855. In no year were more than 10 bags of sea-island cotton sent to market for a maximum return of less than \$800.

The debtor accounts with R. Habersham & Company are intriguing. In general, they run to the pattern of similar records made available by Phillips in his *Plantation and Frontier*.²⁹ Grant evidently used R. Habersham & Company as his banker for the payment of local bills. He also deposited any excess proceeds from other factors with this company, and often gave drafts on Habersham to balance his debts to other factors, even signing notes when his credit account would not cover these drafts. The account with Robert Hogan in Charleston suggests that he received his "luxury supplies" from that source, since items such as "1500 segars," porter, casks of wine, boots, and satins appear frequently. He also drew drafts on these Charleston factors, who had New York connections, for members of his family when travelling in the North and abroad.

In 1854, Grant evidently fell prey to some of the officials of N. A. Harder & Company of Savannah, who on April 15 sold him 50 shares in the Exchange Bank of that city and received \$1,250 as a first installment. Apparently, a two-months experience with this type of investment was enough, as an entry on June 21, 1854 records the return sale of these shares to the factors for the same price. He had another brief experience with commercial banks in the

²⁸ R. P. Brooks, "James Habersham," *Dictionary of American Biography*, 8:68-70 (New York, 1932).

²⁹ Phillips, *Plantation and Frontier*, 150-165.

years 1854-1856 when he kept an account as high as \$6,200 in the Miami Bank of Savannah, but no trace of this account appears after 1857, possibly due to the panic of that year.

Obviously, the entire document is a gold mine for casual readers and careful students alike. Enough of the significant detail has been given to illustrate many features of its contents, yet no brief summary of this data can begin to definitely analyse all of the evidence which rests between its covers. Those unfortunate souls whose understanding of plantation life is based on the abolitionist propaganda which, until very recently, has cluttered up general textbooks on American history would be forced to reorient their thinking after spending a few hours browsing through this volume. The journal of Hugh Grant demonstrates the essential validity of the newer approach to economic activity in the plantation region of the ante-bellum South, which regards plantation owners as among the earliest of American large-scale business entrepreneurs. Grant was owner, general manager, marketing expert, and field superintendent in charge of operations of an enterprise with upwards of \$150,000 of invested capital. This business concern faced many of the obstacles which are associated with production of goods bringing a variable return in a distant market. True, his labor force was different from that used in similar large-scale productions today, but in many ways it was difficult to manage his slaves so as to attain maximum efficiency. Finally, his transportation, credit, and marketing problems were tremendous and required amazing administrative ability.

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THE AGRICULTURAL HISTORY OF IOWA AS A FIELD OF RESEARCH

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This article is being presented concurrently as a report to the President, the dean of the graduate college, the deans of the science and agricultural divisions, and also the heads of the respective departments in the Division of Agriculture at the Iowa State College of Agriculture and Mechanic Arts. The research subjects and the courses of action here outlined will contribute materially to the larger story of agriculture in the Middle West and the entire Nation, and they are also indicative of what the other land-grant colleges may do.—*Editor.*

The Department of History and Government at the Iowa State College is recognized as a pioneer in the development of agricultural history in the fields of teaching and of research and publication. The basic course on the history of American agriculture was introduced as a required subject in the various departments of the Division of Agriculture in 1914. The advanced courses in American and European economic history give considerable attention to the agricultural phases of development. The economic history seminars are devoted largely to agricultural history. Research has been directed to subjects in this field. Among the subjects selected for masters theses may be mentioned studies in the agricultural history of Iowa.

The time is at hand for the expansion and development of agricultural history along graduate research and publication lines. There is a great need for this type of investigation, and adequate moral and financial support is required if it is to be properly developed. The history of agriculture in Iowa commands special consideration for the reason that Iowa as a typical Midwestern Prairie State has important contributions to make in developing a better understanding of the problems of regional as well as State agriculture in their varied aspects. These problems must be approached from the historical and comparative as well as from the economic and purely technical points of view to the end that a sound and farsighted rural economy may be developed. The problems in the agricultural history of Iowa awaiting the attention of the historian may be classified as follows:

1. *Bibliographic Aids.*—Check list of Iowa agricultural papers; check list of agricultural papers and general periodicals containing materials on Iowa agriculture; lists of reports, guide books, gazetteers, and other printed sources; local history sources in cooperation with Works Progress Administration surveys; manuscript sources, public and private, bearing on Iowa agriculture; and diaries.

2. *History of Agriculture by Counties.*—Physiography; Indian economy; sources of immigration; occupation of woodland and prairie country; land policies; land ownership and tenancy; grain and forage crops; livestock; fruits; vegetables; minor products; labor supply; farm equipment; transportation of

farm products; marketing of farm products; financial conditions and operations; processing of farm products; agricultural societies and fairs; farm organizations; farmers' movements; the agricultural press; politics and legislation; State and Federal agencies; agricultural education; agricultural leadership; rural social life and activities; rural health; relation of rural and urban communities; and effect of technology on rural society.

3. *History of Agricultural Industries.*—The grain-growing industry or any of its subdivisions; the livestock industry or any of its subdivisions; forage and other crops; fruit growing; vegetable production; the poultry industry; the bee industry; the dairy industry; the meat-packing industry; the milling industry; canning, pickling, and preserving; and sorghum production.

4. *History of Transportation and Marketing of Farm Products.*—Grain or any of its subdivisions; livestock or any of its products; dairy products; fruit; vegetables; forage crops; honey; cooperative marketing; Federal, State, and local regulations; and agricultural prices.

5. *History of Farm Organizations and Movements.*—Organizations for the promotion of some special end or industry (Iowa Corn and Small Grain Growers Association; Iowa Beef Producers Association; Iowa Swine Producers Association; Iowa Horse and Mule Breeders Association; Iowa State Dairy Association; Iowa State Horticultural Society; farmers' elevator companies; livestock shipping associations; cooperative creamery associations; and other commodity marketing organizations).

Organizations designed to unite the farmers as a class (the Grange; the Greenback movement; the Farmers' Alliance; the Populist movement; the Farmers' Union; the American Society of Equity; the Farm Bureau; the 4-H-Club movement; the Young Farmers' movement; and Future Farmers of America).

6. *History of Land Tenure.*—Land systems and tenures; land legislation; land prices and speculation; land ownership and operation by owner; absentee ownership and operation by a tenant; absentee ownership and operation by a farm manager; chain farming; corporation farming; subsistence farming; tenancy; land utilization and conservation; Federal legislation; taxation of farm lands; and tax delinquency and scavenger sales.

7. *History of Agricultural Education.*—Agricultural societies; agricultural fairs; the agricultural press; farmers' movements; Iowa State College; the extension service of Iowa State College; the experiment station; the county agent; farmers' institutes; the Smith-Hughes movement; the consolidated school movement; agriculture in the high schools; county agricultural planning committees; and home demonstration agents.

8. *History of the Government in Relation to Agriculture.*—Agricultural legislation; the State Department of Agriculture; and Federal relations.

9. *Biographies of State Agricultural Leaders.*—S. A. Beach; J. L. Budd; Charles F. Curtiss; Suel Foster; Benjamin F. Gue; P. G. Holden; Edwin T. Meredith; L. H. Pammel; C. C. Parry; Dante Pierce; James Pierce; Henry Wallace; Henry C. Wallace; Henry A. Wallace; James Wilson; and William Duane Wilson.

10. *Miscellaneous Projects in the Agricultural History of Iowa.*—River settlements in Iowa; prairie farming; agricultural labor; farm implements and machinery; agricultural depressions; racial groups (English, Germans, Dutch, Swedes, Norwegians, and Welsh) and their influence on Iowa agriculture; standards of living; rural architecture; relation of democratic institutions to the history of agriculture; and history of ideas and observations on agriculture in Iowa.

The development of a program of research and publication in the agricultural history of Iowa is dependent on several considerations: 1. Recognition by Iowa State College of the agricultural history of Iowa as a major field of inquiry, and the adoption of a policy for the promotion of research and investigation in this field. 2. Wider utilization of the advanced courses of instruction now offered by the Department of History and Government. 3. Collection of the materials of agricultural history insofar as may be deemed practicable and desirable. 4. Establishment of graduate fellowships and research assistantships. 5. Direct financial aid for history and government staff members on not less than one-fourth- or more than one-half-time research, including the supervision of the research activities of graduate fellows and research assistants.

A series of monographic studies should be planned and coordinated with a view to their providing the basis for the preparation and publication of an authoritative and well-documented history of agriculture in Iowa. Research projects should be planned which will relate cogently and effectively the work at Iowa State College with that being done in other States and regions. Particularly important is the recognition of the fact that the history of agriculture in Iowa is only a part of the larger story of agriculture in the Middle West and the whole country.

Iowa State College
Ames, Iowa

NEWS NOTES AND COMMENTS

THE 1939 ANNUAL MEETING OF THE AGRICULTURAL HISTORY SOCIETY

The Agricultural History Society held its 1939 annual meeting in Washington, D. C., on May 23 and 24. This year's meeting was of special interest and significance as the Society has assumed leadership in an active movement to establish a national agricultural museum and regional institutions of a similar nature. Furthermore, the meeting was held concurrently with the Conference on Agricultural History, called for the U. S. Department of Agriculture by Under Secretary M. L. Wilson on May 22, 23, and 24.

The Society's first session was held on the evening of May 23 in the Auditorium of the Department of Agriculture. Dr. Charles A. Browne of the Bureau of Chemistry and Soils gave an illustrated lecture entitled "A National Museum of Agriculture; the Story of a Lost Endeavor," in which he discussed the "lost" museum of the Department of Agriculture and representative agricultural museums in Europe which constitute examples to America.

At the Society's dinner and business meeting on May 24, held at the Cosmos Club, Dr. Russell H. Anderson, the retiring president, delivered an address on "A National Agricultural Center as a Focal Point." This was followed by informal discussion in which Dr. Carleton R. Ball of the Tennessee Valley Coordinating Committee, Dr. Allen Eaton of the Russell Sage Foundation, and others participated. On Dr. O. C. Stine's motion, the newly elected president was instructed to appoint a committee to sponsor the national agricultural museum movement. The committee, as formally announced, consists of the following members: Dr. Carleton R. Ball (chairman), Dr. Russell H. Anderson, Dr. C. A. Browne, Mr. Allen Eaton, Mr. Herbert A. Kellar, Dr. Frederick L. Lewton, Dr. Arthur G. Peterson, Dr. O. C. Stine, Dr. M. L. Wilson, and Dr. Carl R. Woodward. Another motion instructed the incoming

president to transmit a letter to Dr. Rodney H. True on the occasion of his retirement as director of the Morris Arboretum of the University of Pennsylvania, expressing regret at his inability to attend the annual meeting, recording its appreciation of his activities as a founder of the Society and of his continued interest and service in its welfare, and wishing him many years in which to complete the various historical projects that he has outlined.

Ballots having been submitted to the members of the Society, the following officers were declared elected for the year 1939-40: president, Mr. Everett E. Edwards, U. S. Bureau of Agricultural Economics; vice president, Professor Harold E. Briggs, University of Miami, Coral Gables, Florida; secretary-treasurer, Dr. Arthur G. Peterson, U. S. Bureau of Agricultural Economics; executive committee, Professor Earle D. Ross, Iowa State College, and Professor Wendell H. Stephenson, Louisiana State University. The officers elected are in accord with the names submitted by the nominating committee which consisted of Professor Avery Craven, University of Chicago (chairman), Dr. C. A. Browne, U. S. Bureau of Chemistry and Soils, Mr. Lyman Carrier, U. S. Soil Conservation Service, and Professor Louis B. Schmidt, Iowa State College.

The auditing committee, consisting of Dr. Arthur G. Peterson and Mr. Charles E. Gage of the U. S. Bureau of Agricultural Economics, and Dr. Albert V. House, Jr., of Wilson Teachers College, approved the report of the secretary-treasurer for the preceding year. Dr. Peterson also presented a comprehensive statement of the financial assets and liabilities of the Society.

THE U. S. DEPARTMENT OF AGRICULTURE AGRICULTURAL HISTORY CONFERENCE

The United States Department of Agriculture, under the direction of Dr. M. L. Wilson, the Under Secretary of Agriculture,

held a conference on agricultural history in Washington, D. C., on May 22-24, 1939. This conference constituted one of a series on the social sciences and their relation to the work of the Department of Agriculture and of the agricultural experiment stations throughout the United States.

The conference on agricultural history was opened with a survey of the present activities of the Department and of the official work that has been done in historical research. Special attention was given to the value of historical research techniques and historical data to the Department in carrying out its multitudinous functions as an executive branch of the Federal Government. Consideration was also given to the delineation of the research activities that should be given special encouragement, to the ways and means of publishing the results of such research, and to its organization and direction, so far as the Department of Agriculture and the agricultural experiment stations are concerned.

The formal membership of the agricultural history conference consisted of the following: Professor John D. Hicks of the

University of Wisconsin (chairman), Dr. Russell H. Anderson of the Museum of Science and Industry of Chicago, Dr. Kathleen Bruce of the Survey of Federal Archives for the Commonwealth of Virginia, Director R. E. Buchanan of the Iowa Agricultural Experiment Station, Dr. Solon J. Buck of the National Archives, Professor Harry J. Carman of Columbia University, Professor Avery Craven of the University of Chicago, Director Luther H. Evans of the Historical Records Survey of the Works Progress Administration, Professor Paul W. Gates of Cornell University, Dr. U. P. Hedrick of the New York State Agricultural Experiment Station, Mr. Herbert A. Kellar of the McCormick Historical Association, Mr. Donald Murphy of *Wallaces' Farmer*, Dr. Edwin G. Nourse of the Brookings Institution, Dr. Henry C. Taylor of the Farm Foundation in Chicago, Professor Caroline F. Ware of American University, and Professor Donald R. Young of the Wharton School of the University of Pennsylvania. It is hoped that a digest of the conference's proceedings and a formal report of its recommendations can be made available to those who are interested.

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Correspondence concerning contributions and books for review may be sent to Everett E. Edwards, Room 3901, South Building, 13th Street and Independence Avenue, S.W., Washington, D. C.; correspondence concerning membership dues and business matters, to Arthur G. Peterson, at the same address.

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